Proceedings of the
American Association of Textile Chemists and Colorists

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FEBRUARY 27, 1956

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AATCC Newsletter

February 27, 1956

RESEARCH NEWS IN GENERAL

Test procedures recommended previously by the Joint ASTM-AATCC Committee on Nonwoven Fabric, for determining fire-resistant properties and absorbency rate of bonded fabrics, are being presently reviewed by AATCC subcommittees for presentation to TCR for approval as AATCC test methods. . . . Committee on Creasing Properties of Fabrics -- formerly known as the Committee on Evaluation of of Durable Finishes -- with Ernest R Kaswell as chairman, has (largely through the efforts of one of its members, C R Williams, Plastic Division, Monsanto Chemical Co) been able to present a revision of Tentative Test Method 66-53, "Evaluation of the Wrinkle Resistance of Fabrics," by means of the Wrinkle Recovery Tester. . . . Analysis of data from the "Operation Cue" test -- fabrics under atomic explosion -- has been completed, and a presentation on this subject is being made at various section meetings, including initially Northern New England February 17 and New York March 2. . . . Meetings of TCR and its subcommittees held in January in New York were packed full of facts and action: Chairmen of ECR and TCR were authorized to reorganize listing of Test Methods in the Year Book. . . . Abrasion Committee decided to correlate all studies of past three years, submit these to a steering committee for recheck, and then announce final conclusion. Theodore F Cooke was elected chairman of this Committee for the next term. . . . Standard Soils Committee (O C Bacon, chairman) composed rough draft of a tentative standard test method of using soiled fabrics in the evaluation of detergents. . . . Standard Test Fabrics (G Wernz, chairman) reported that, during the past year, it has succeeded in developing a specification for the production of the standard six-fiber test cloth recommended for various AATCC test procedures. . . . Color Committee (F J O'Neil, chairman) reported the Small Color Difference Committee had been absorbed into this committee. Color Committee plans to work out a grey scale with additional steps. . . . Analytical Methods (P J Wood, chairman) reported a recent meeting of that committee at which five participating members presented data on a common sample of sodium hydrosulfite, analyzed repeatedly by three different methods.

Copy for manuscripts of Parts I, II and III of the Year Book have been assembled by G Robert Thompson at Lowell and sent to Editor W H Cady. Complete rearrangement of the order of listing committee rosters, committee reports, and AATCC test methods is being planned, for more convenient use of the book.

AT RESEARCH HEADQUARTERS IN LOWELL

At the request of the Committee on Dimensional Change, AATCC Research Staff has undertaken a project to develop a dimensional restorability test which would reflect the minimum shrinkage of fabrics in end use. . . . Flammability Committee has requested Lowell staff do additional work toward refinement of the alternative method using the Launder-Ometer metal tubes for the drycleaning and washing procedures in the Flammability Test Method. . . . Glen Kidder, BS from LTI in 1934, has assumed his duties as research associate at AATCC headquarters. He was formerly with Sears Roebuck Laboratories in Chicago and most recently with Research and Development Division, Lever Brothers Co, where he was in charge of the Lux laboratories. His first assignment with AATCC is on the Dimensional Change project. . . . Recent visitors to AATCC labs were: Frederick T Lense and G W McEwan, of Monsanto Chemical Co, for discussions with Dr Stiegler; John Lane, president of Atlas Electric Devices, Chicago, also visited Dr Stiegler, to discuss manufacturing aspects of the Accelerotor. . . . Also, Albert E Johnson, chairman of Corporate Membership Committee; ECR Chairman Charles W Dorn; TCR Chairman Charles A Sylvester; and P J Fynn.

COMMITTEE ACTIVITIES

New committee heads for the new year include Merrit Bidell, Pressing Committee; R Hobart Souther, Stream Pollution; J Schwartz, Antimicrobial Agents; T F Cooke, Resistance to Abrasion; R C Geering, Flammability of Clothing Textiles; A E Johnson, Drycleaning Test Methods; L L Heffner, Evaluation of Fire Resistant Textiles. . . . Proposals to drop Standard Test Method 37-52, Colorfastness of Silk Textiles to Commercial Laundering and Domestic Washing; and Tentative Test Method 38-52, Colorfastness of Wool Textiles to Commercial Laundering and Domestic Washing, are being circulated to TCR. It is felt that the washfastness tests originally designed for testing cotton and linen can now be safely applied to silk and wool, and the above are therefore not needed.

AATCC CALENDAR

COUNCIL

Apr 20 (Benjamin Franklin Hotel, Philadelphia, Pa); June 15; week of Sept 10th (New York, N Y); Nov 16; Jan 18, 1957.

NATIONAL CONVENTIONS

Sept 13-15, 1956 (Waldorf-Astoria, New York) (as part of the Perkin Centennial. Sept 10-15); 1957 (Boston); 1958 (Hotel Conrad Hilton, Chicago); 1959 (Washington, DC)

HUDSON-MOHAWK SECTION

March 16 (Hotel Johnstown, Johnstown, N Y); May 18 (Ladies Nite); June 22 (Annual Outing).

MID-WEST SECTION

May 5 (Plankington Hotel, Milwaukee, Wis); June 16 (Outing—Browns Lake Resort, Burlington, Wis)

NEW YORK SECTION

Mar 2 (Hotel Delmonico, New York, N Y); Mar 23, Apr 27, May 18 (Kohler's Swiss Chalet, Rochelle Park, N J).

NIAGARA FRONTIER SECTION

Mar 3 (Canada—meeting to be held in conjunction with Ontario Section, CATCC); Apr 27 (U S).

NORTHERN NEW ENGLAND SECTION

Apr 27 (Lowell Technological Institute, Lowell, Mass); Sept 28 (Annual Outing —Wachusett Country Club, West Boylston, Mass); Oct 19 (Science Park, Boston, Mass); Dec 1 (Annual Meeting—Hotel Vendome, Boston)

PHILADELPHIA SECTION

Mar 2 (Adelphia Hotel, Philadelphia); Apr 20 (Ladies' Night—Benjamin Franklin Hotel, Philadelphia); May 25 (Annual Outing — Huntingdon Valley Country Club, Abingdon, Pa); Sept 28 (Abraham Lincoln Hotel, Reading, Pa); Nov 2 (John Bartram Hotel, Philadelphia, Pa); Dec 7 (Kugler's Restaurant, Philadelphia, Pa)

PIEDMONT SECTION

Apr 7 (Sir Walter Raleigh Hotel, Raleigh, N C); June 8-9 (Outing—Mayview Manor, Blowing Rock, N C); Oct 6 (Annual Meeting—Hotel Charlotte, Charlotte, N C)

RHODE ISLAND SECTION

Mar 22 (Crown Hotel and Providence Engineering Society); Apr 26 (Student Night, Rhode Island School of Design); May 25 (Ladies' Night, Sheraton-Biltmore Hotel); June 15 (Annual Outing, Pawtucket Country Club); Oct 18 (Johnson's Hummock's Grille); Dec 6 (Annual Meeting, Johnson's Hummock's Grille)

SOUTH CENTRAL SECTION

Apr 28 (Hotel Patten, Chattanooga, Tenn); June 22-23 (Lookout Mountain Hotel); Dec 1 (Hotel Patten)

WESTERN NEW ENGLAND SECTION

Mar 16 (Rapp's Restaurant, Shelton, Conn); May 11 (Ladies' Night—Waverly Inn, Cheshire, Conn); June 15 (Outing); Oct 5 (Annual Meeting—Hartford, Conn); Nov 16 (Rapp's Restaurant, Shelton, Conn)

NOTICE

To Local Section Officials

To ensure that the activities of your Section receive proper publicity in the Proceedings, it is desirable that material be submitted direct to American Dyestuff Reporter, 44 E 23rd St, New York 10, N Y.

ADVANCE NOTICES OF MEETINGS———Copy must be submitted *at least two weeks* prior to the publication date. ADR is published on alternate Mondays. It is urged that the dates be taken into consideration when copy is submitted.

Advance notices should include the date and site of the meeting; the speaker's name, position, business affiliation, and subject; a short abstract of the paper (optional); details of additional meeting highlights, eg, nominations or election of officers, special awards, activities of Sectional committees, etc.

MEETING REPORTS———Complete reports should be submitted as soon as practical after a meeting. Information should include attendance figures; captioned photographs of meeting principals (speaker, section officials, etc); and any additional points not covered in the advance notice. An extensive resume of the speakers' remarks is not necessary if the paper is to be submitted for full publication in the Proceedings.

PAPERS———Two copies of each paper presented before local sections should be sent to the offices of the American Dyestuff Reporter. It is very important that every speaker be acquainted with the "Notice to Authors", which appears periodically in the Proceedings. Additional copies of said notice will be sent to section officials on request.

It is imperative that each Section appoint an official whose responsibility it is to see that the speaker's remarks are submitted. In cases where prepared manuscripts are not immediately available to the Section official, it may be necessary to acquaint the author with the address to which he should send his material when it is finally prepared.

In cases where the material is extemporaneous (panel discussions, question-and-answer periods, open forum, etc) it is the responsibility of the Section to provide for stenotype service, so that a complete record may be available.

PRESENTATION OF A PAPER BEFORE A LOCAL SECTION DOES NOT GUARANTEE PUBLICATION IN THE PROCEEDINGS, AS THE FINAL DECISION RESTS WITH THE AATCC PUBLICATIONS COMMITTEE. However, most papers will be acceptable provided they conform in content and layout to established practices of AATCC.

AATCC Monograph No. 2

"THE APPLICATION OF VAT DYES"

"The group of fifteen editors responsible for this monograph consists of a well-balanced cross-section of American industry concerned with the production, marketing and application of vat dyes. The AATCC is to be congratulated on the production of a comprehensive survey of American vat dyeings and printing practice which is the major theme of this application . . . the book will be useful as a work of reference at this side of the Atlantic and as a working manual for the American colorists for whom it was designed. . . . If a clear account of American practice is required . . . the enquirer *must* have access to this volume."—*JOURNAL OF THE TEXTILE INSTITUTE* (England).

"This monograph contains the work of many mill-experienced authors, plus good, sound chemical and application principles developed in the laboratories and mills enjoying AATCC membership. . . . This book puts between two covers much information that a dyer is constantly searching for. It is a good investment for any laboratory, dyehouse, or printshop."—*TEXTILE WORLD*.

". . . this monograph should be in the hands of every user of vat dyestuffs, every student and every teacher. The book is well indexed and includes valuable lists of equivalent trade names. It will certainly take its place as a standard book of reference."—"*JOURNAL OF THE SOCIETY OF DYERS AND COLORISTS* (England).

"This book is . . . abreast of the latest technical developments and research. Its value is increased because of the lack of books in this field today . . . we can readily recommend this book to all technical and practical men"—*MELLIAND TEXTILBERICHTE* (Germany).

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1955 National Convention——

Symposium

"LAUNDERING, DRYCLEANING AND GARMENT DYEING"

Held September 23, 1955 in the West Room,

Haddon Hall Hotel, Atlantic City, N J

I—INTRODUCTORY REMARKS BY THE CHAIRMAN

W J MOONEY

Pennsylvania Association of Dyers and Cleaners

MAY I express the gratitude of all textile maintenance industries for the indication this morning's meeting affords———the American Association of Textile Chemists and Colorists extending its interest to fields of consumer end use and experiences, and the renovation of textile products. We all sincerely hope that this beginning will extend to a new and fruitful era in the relationships between all in the textile manufacturing and the textile maintenance industries.

Our symposium this morning will feature a series of papers on various aspects of textile care and maintenance. If, in the complex organization of the textile industry from fiber manufacture to consumer, we of the service industries have a place at all, it is, of course, at the end of the line. When your work is finished, we begin.

That place, however, even at the end of the line, is both important and strategic, for from it we can appraise and admire your great handiwork and pay tribute to your overall contributions toward making, and keeping, Americans the best-dressed people on earth. At the same time, however we do occupy the position where we must contend with the mistakes you make.

It is somewhat in our selfish interest to applaud your creativeness all through the industry from fiber to finished apparel—and to urge you on, to spur your efforts to even greater achievements in the varieties of fabrics, the beauty of colors, the magic of finishes and the splendor of styles. For it is true that the more you bring forth to tempt the aesthetic senses of our peoples, and their vanities, the more there must be for us to keep conditioned. We shudder at the thought of the one-dress, or the one-suit wardrobe and at the great wash-and-wear promotions that are going on at the present time. We hope it does not prove to be practical, and most surely do believe that the monotony of it would take away much of the joy of living that you have supplied with your creations.

It is a strange quirk in this current dynamic economy, experiencing the nation's greatest boom through the medium of the highest consumer purchasing power of all time, that many facets of our great basic textile industry should be striving to reduce the wardrobe to a single garment —a pair of socks, suit of underclothing, a shirt and suit of clothes to travel the world without need or benefit of laundry or drycleaning — while so many other great industries are agressively promoting a fuller and more lavish use of their product. For example: all sorts of inducements and enticements to put two Cadillacs in every garage, a television set in every room, etc.

We in the textile industry ought to take some note of the present effort to promote the use of products and do something to enlarge these wardrobes rather than to reduce them to the extent that wash-and-wear promotional ads would have us believe can be accomplished.

In speaking for the dry-cleaning industry, and for Mr Johnson and the laundry industry, I know that all segments of the service industries, which are serving in the renovation of the textiles that the public uses, are conscious of their responsibilities to keep abreast of the creativeness of the textile industry by developing new techniques for renovating and servicing the new things brought forth, so that the maximum utility for their use in modern living can be obtained. We seek not only to preserve our own businesses, but to make our contribution to the fuller and happier life.

All of us in textiles are aware that textile fabrics do not have absolute perfection. All of us are aware, too, that it is inevitable that mistakes will be made in design, weaving, dyeing and finishing, and in the fabrication of both textile fabrics and garments that reach our market places from time to time. We in drycleaning and the other service industries know too that errors will occur in the renovating processes on occasion. But, it is our objective in the service industries, as you have repeatedly declared it to be yours in the textile industry, to obtain the highest order of consumer satisfaction with textiles and their renovation — to eliminate as far as possible consumer discontent.

To this end, we in the service industries are conscious of, and accept our responsibility to keep abreast of your creativeness

by developing techniques for renovating and otherwise servicing the things you bring forth, so that maximum utility for their full use in modern living is obtained. We make it a serious business to keep the lines of communication on the developments in textiles, and the processes necessary for their proper care and renovation, completely open to all those drycleaning processors who participate with us in these steady activities, which include a full and continuous program of evaluation research — so necessary to be done if we are to find answers to consumer experiences and problems with textiles.

In our search for the origin, and then the solution, of the fault that has appeared, it is our purpose to determine as scientifically as is possible the responsibility for the happening. If it has occurred in the practice of drycleaning, we insist that full responsibility be borne by the drycleaner. When consumer misuse in wear or care is responsible we assume the task of education that has as its objective elimination of any such further abuse. If the fault lies in any part of the manufacture of the fiber or fabric, or in the fabrication of the article, we believe that you of the textile industry must fully assume your responsibility and then correct the fault so that recurrence will be prevented. In this very simple and straightforward manner consumer satisfaction and confidence can be obtained for all of us, and consumer discontent eliminated.

If I may make selfish use of this privilege to visit with you today, it is to very sincerely ask that you more fully open the lines of communication between you of the textile industry and we in the service industries, so that we can better know what you are planning and what you are doing and thus be enabled to consult with you on the consumers' interest in the things you must turn into dollars to make your enterprise successful.

We of the service industries accept the challenge of achieving consumer satisfaction with textiles, not only to preserve our businesses and our professional prestige, but as our contribution toward a fuller and a happier life for all of our people. We have the will to work closely with you. We have the facilities for the determination, quickly and surely, of the things that can guide you. They are yours to use. If we will work together in the full trust and confidence of each other, we will solve all of our problems successfully.

Four papers will comprise this symposium.

II—MEASURING THE WHITENING EFFECTS OF FLUORESCENT DYES AND PERBORATE BLEACHES ON COTTON*

MARGARET S FURRY and PHYLLIS L BENSING

Clothing and Housing Research Branch
Agricultural Research Service
U S Dept of Agriculture
Washington, D C

QUESTION: I have to bleach yarns for upwards of two hundred customers. There are, at the present time, sixteen standards of bleach in our range, each one preferred by one or more of these customers. As you might understand, it is very difficult to keep those sixteen standards consistent. I am wondering if you could recommend an instrument, which would be relatively simple to operate and which could be handled by not-too-well-educated technicians, so that they would be more likely to keep the bleaches uniform. Perhaps this might be in the form of a standard which would not vary with age.

ANSWER: I am not sure I can answer that, but in our work we refer to a porcelain enamel standard, which is compared to a primary standard of magnesium oxide. That does not change.

Both instruments that I have discussed are really very simple to operate. The second instrument is perhaps a little more simple than the first because it requires just two readings. If you are interested in fluorescence, you read it with and without the filter. The calculation is very simple. It is a simple percentage of the change. I would think that either instrument could be used satisfactorily.

Q: Have you attempted to use or adapt the Photovolt Reflective Meter to your work, rather than the specialized instrument by Hunter?

A: I have used the Photovolt meter, and we found it satisfactory for that work we did on the soil-removal efficiency of detergents.

Q: Have you tried to use it with an ultra-violet addition built into the blue filter or to the red filter?

A: It can be used that way, but I haven't used it.

Q: Was there an ultra-violet absorbing filter in the reflected beam of the second instrument, which had an ultra-violet source?

A: Mr Hunter could answer that much better than I. This was part of a development he has been working on. I know that he has placed the Noviol filters differently in his second instrument. There were two Noviol filters in this first instrument that we used. I think that in the second instrument he has switched one from the incident to the viewing beam.

Q: Then that would exclude reflected ultra-violet light that reaches the cell?

A: I would have to check with Mr Hunter on that.

* Editor's Note: This paper was published in full in the *American Dyestuff Reporter*, issue of November 7, 1955, pages P786-90. The discussion which followed the presentation of the paper by Miss Furry is published here.

III—LAUNDERABLE TEXTILES IN 1955

GEORGE H JOHNSON

American Institute of Laundering
Joliet, Ill

INTRODUCTION

THE laundering qualities of washable textiles depend largely upon how a given fabric is constructed, dyed and finished, and upon the end use to which that fabric is put. Every year the commercial laundry industry handles thousands upon thousands of individual textile items to the complete satisfaction of consumers. Unfortunately these same laundries, in handling other supposedly launderable items, encounter difficulties such as excessive shrinkage, poor wash and light fastness, poor resistance to bleeding and to perspiration (chiefly in blends), and poor seam construction, as well as unsatisfactory gas-fading and chlorine-retentive properties. These and other types of situations often cause consumer reactions that are unfavorable to the textile item that has been laundered or to the laundry involved in handling the merchandise. Much of this can be avoided if proper attention is given to the laundering qualities of the fabric and to the end-use to which a cutter puts that fabric, including the proper choice of closures and findings. The original fabric is only part of the problem of washability. How that fabric is cut and tailored and what buttons or findings are used also determine laundering qualities.

It should be understood that, even though acetate and rayon have shown an astonishing growth and are competing with cotton in many launderable items (and now the chemical fibers are showing strength), cotton, in the form of sheets and pillowcases, hand, huck and terry toweling, men's shirts, pajamas, underwear, handkerchiefs, ladies' housedresses, coveralls, wash rugs and curtains, is still an important part of the consumer's laundry bundle. For the present and the foreseeable future, cotton is the dominant textile fiber in the average laundry bundle.

Table I illustrates a growing use of fibers in the United States, and further substantiates the continuing use of cotton in washable items. Note that in 1920 106.5 million people consumed 2828.1 million pounds of cotton, whereas in 1954, 162 million consumed 4138.7 million pounds. The 1920 per capita cotton consumption was 26½ pounds. In 1953 per capita cotton usage was 28.6 pounds. 1954 usage was 25½ pounds.

The importance of good laundering qualities in modern-day washable textiles is perfectly obvious to all segments of the textile industry. Washables, almost regardless of their fiber content, can be made to launder perfectly or they can be so constructed that they fail in the first laundering, whether at home or in a professional laundry.

The important point to consider is the end-use of a given textile. This is true not only of the old-line staple washable items made from cotton, linen, rayon, acetate and wool, but also of the newer fibers and blends containing nylon, Orlon, Dacron, Vicara, Dynel, Acrilan, and Creslan.

An excellent example of how a group of industries can work together to develop consumer-satisfactory washable standards is illustrated by the work that was completed late last spring. As a result of cooperative effort, participated in by technical representatives of AATCC, the following trade associations have agreed to a labeling program for shirts that should prove helpful not only to the consumer, but also to the various industries represented by these associations: American Institute of Laundering; Associated Menswear Retailers of New York; National Association of Retail Clothiers and Furnishers; National Association of Shirt, Pajama and Sportwear Manufacturers; National Institute of Drycleaning; and National Retail Dry Goods Association.

Table II gives a break-down of the 1954 US manufacture of acetate and rayon.

DISCUSSION

FIBER USAGE IN TODAY'S WASHABLES———There was a time when a laundryowner had to know little more than the laundering properties of cotton, linen, wool and silk. In the early 20's he began to hear about "artificial silk". Today he finds himself called upon to launder or dryclean textile items containing numerous types of fibers and their blends, many of which were unheard of only recently. However, he still regards cotton as the most important launderable fiber.

Table III lists today's fibers, many of which reach the laundry industry in washables.

Nylon also is produced in the United States in 15-, 12-, and 10-denier monofilaments for women's sheer hosiery. In addition, a number of low-melting-point polymers and copolymers are produced, which rarely reach a laundry as a launder-

TABLE I

TEXTILE FIBERS USED IN THE UNITED STATES[1]
(Millions of Pounds)

Year	US Population Including the Armed Forces (millions)[2]	Cotton	Wool	Acetate Rayon	Chemical	Silk	Annual Total
1920	106.5	2,828.1	314.2	8.7	....	29.2	3,180.2
1930	123.1	2,610.9	263.2	118.8	....	75.6	3,068.5
1940	132.0	3,953.6	407.9	482.0	4.4	35.8	4,883.7
1950	151.2	4,680.1	647.0	1,351.4	140.6	8.4	6,827.5
1953	158.3	4,520.7	488.0	1,223.0	283.6	5.4	6,521.5
1954	162.0	4,138.7	381.0[3]	1,094.2	346.1	6.4	5,966.4

[1] *Textile Organon*, Textile Economics Bureau.
[2] U S Bureau of Census.
[3] 266 million pounds of apparel class and 115 million pounds of carpet class wools were used in 1954.

TABLE II

MANUFACTURE OF ACETATE AND RAYON IN THE UNITED STATES (1954)[1]

Filament	Millions of Pounds	Staple and Tow	Millions of Pounds	Total Production	Millions of Pounds
High tenacity rayon	342.5	Rayon	311.1	Rayon	832.8
Regular and intermediate tenacity rayon	179.2				
Acetate	197.1	Acetate	64.3	Acetate	261.4
	718.8		375.4		1,094.2

[1] Textile Economics Bureau.

able item. These include the vinylidene chloride-vinyl chloride copolymers Saran, Velon, and Permalon; polyethylene products, such as Reevon, Wynene, Avisco PE, and Polythene; and the vinyl chloride—vinyl acetate copolymer Vinyon HH.

LAUNDERING METHODS ——— When a laundry bundle containing soiled pieces reaches the so-called "breaking table", the laundry classifier, usually after weighing the package, "breaks" it into its various components, based upon type of article, color and, within limits, upon fiber content. No laundry classifier, and few, if any, textile technicians in these times, can look at a fabric and accurately determine its fiber content.

As a consequence, in commercial laundries, soiled work is separated into various classifications for separate handling. Major classifications include the following:

1) White cotton flatwork and wearing apparel. For ease of distribution to the finishing department after being washed, flatwork frequently is netted separate from wearing apparel. Cotton prints and striped fabrics containing white areas are washed with white work, otherwise the white area, with repeated laundering, becomes badly grayed.
2) White and colored cotton dress shirts.
3) Light-colored cotton wearing apparel. Preferably the pink, yellow, orange and lavender items are washed separate from the light grays, blues, and greens. Sometimes, with small loads, this double separation becomes uneconomic.
4) Dark-colored cotton wearing apparel.
5) Sport shirts, which frequently contain blends of a number of fibers separated into white, light-, and dark-colored classifications.
6) Hosiery, light- and dark-colored.
7) Blankets, cotton separated from wool.
8) Curtains.
9) Drapes.
10) Pillows.
11) Washable rugs.
12) Hand-washable items.

Since a laundry classifier cannot possibly recognize all of the fibers that are present in blends, she uses judgment based upon experience. If a sport shirt, for example, feels or looks like wool, the article is washed as a wool shirt. If it feels or looks like rayon, acetate, or silk, the piece is washed as if it were such. Thus, blends containing nylon, Orlon, Dacron, Dynel, Acrilan, or Vicara would be washed, if in a washable item, just as if they were rayon or wool, depending upon the fibers with which they are blended.

Fortunately, the washing processes used for rayon or wool are applicable to the newer chemical fibers. For safe laundry procedure, including washing, extracting and finishing, the method chosen must be one that *properly* launders those fibers requiring the *greatest* amount of care. For example, if a wool-cotton blanket comes to a laundry a wool rather than a cotton-type washing formula will be used in order to prevent the wool from being felted.

WASHING FORMULA———From the very beginning it should be recognized that there is no such thing as a "standard washing formula". There are too many factors beyond the control of a laundry owner to permit much standardization. The customer, not the laundry, purchased the textile originally.

Hotel flatwork used one night by a hotel guest is bound to be less heavily soiled than the same flatwork used for a week in a home. The more lightly soiled hotel flatwork may be washed satisfactorily with only two short suds followed by rinsing. Identical sheets from a weekly laundry bundle may require the use of four suds to accomplish the same purpose.

Or, a New England water supply may contain 30 parts per million of bicarbonate alkalinity, whereas an Illinois water supply may contain 270 ppm. In the latter instance, larger quantities of sour are required to neutralize residual traces of detergent alkalinity in the load plus that contained in water supply absorbed by that load.

On the whole, the only factors in a washing cycle that appear to be somewhat uniform for all conditions are the length of a suds or the length of a rinse. Very little additional soil is suspended by a properly built detergent after 5-6 minutes of actual sudsing time. Likewise, during rinsing, uniform dilution and suspension normally are obtained in 3 minutes rinsing time. However, if a washer of a given size is underloaded, fewer rinses will be required after sudsing than for a full-size load to eliminate excess detergents and soil.

NUMBER OF SUDS AND RINSES ———In general, the commercial laundry industry uses the multiple-suds principle of washing. A series of 5 to 10-minute suds are employed, the number varying from 2 to 5, depending upon the soil content of the load. With full loads, at least four rinses are required to reduce the soap and alkali content to a point where souring becomes practical.

SUDSING AND RINSING TEMPERATURES———Sudsing temperatures range from 90°F or less for rayons, acetates, "chemical" fibers, and wool to 160°F for ordinary white-cotton loads. Greasy butcher's aprons may require boiling temperatures to obtain proper emulsification. Typical maximum washing temperatures are shown in Table IV.

pH OF LAUNDRY OPERATIONS ———The pH of sudsing operations for cotton generally varies from 10.5 to 11.0. Greasy loads may reach pH 11.5 to 12.0 because of the effect of added alkali to bring about better emulsification. The pH of a suds may be affected by the bicarbonate content of the water supply,

TABLE III
CLASSIFICATION OF TODAY'S FIBERS

CELLULOSIC

cotton
linen
rayon
acetate (Estron)
triacetate
  Arnel
  Courplets (Eng)
  Tricel (Can)

PROTEIN

wool
mohair
silk
Vicara
Ardil (Eng)

POLYAMIDE

nylon
  Type 66 (adipic acid)
  Type 200 (semidull)
  Type 670 (dull)
  Type 610 (sebacic acid)
  Type 6 (caprolactum)

POLYESTER

Dacron[1]
Terylene (Can)
Terylene (Eng)

ACRYLIC

Orlon[2]
  Type 42 (staple)
  Type 81 (filament)
Dynel
Acrilan
X-54 (Creslan); experimental basis

MISCELLANEOUS

glass
jute
ramie

[1] In Germany Dacron is known as Diolen; in Holland, as Enkalene; and in France, as Tergal.
[2] Orlon is known as Pan in Germany.

TABLE IV
TYPICAL MAXIMUM WASHING TEMPERATURES

	(°F)
White cotton work and wearing apparel plus colored pieces containing white areas; also white and colored cotton shirtings	160
Light-colored cottons	120
Dark-colored cottons	90
Wool materials, including blankets	90
Acetate, rayon, nylon (regular and type 6)	90
Orlon, Dynel, Acrilan, Vicara, etc	90
Curtains	90
Colored cotton work clothing materials, such as denims, twills, herringbones, etc, used in work clothing, should be resistant to boiling washing temperatures if they are to come in contact with grease, paint, mineral oils, etc	200

when zeolite-softened waters are used that are high in bicarbonate alkalinity.

Souring operations normally are carried to pH 5.0.

WASHROOM SUPPLIES———Tallow and low-titer soaps are very popular in the laundry industry, largely because soft water is used almost universally. Synthetic detergents (chiefly the anionics, such as alkylarylsulfonates and sulfated fatty alcohols) have limited use. CMC also is sold to the trade.

The alkalis employed include sodium carbonate, metasilicate, sesquisilicate, orthosilicate and trisodium phosphate. Caustic soda also is used with greasy cotton loads, as are the bentonite clays.

Bleaching agents employed for white cotton loads include carboy bleach and high-test powdered hypochlorite products (70% available chlorine). Hydrogen peroxide or sodium perborate is used to bleach wool and silk. Recently, dichlorodimethylhydantoin and trichloroisocyanuric acid have been offered to the trade for white cotton loads, and also in packages for home use.

Commercial laundry sours include sodium, ammonium, and zinc silicofluoride or sodium or ammonium acid fluoride, all harmless to cellulose.

Starches employed for the most part are thin-boiling corn and/or wheat. Blues are organic in nature, usually being acid in type. Ultramarine, Prussian and cobalt blues are rarely, if ever, used in commercial laundries.

Stripping agents for stain removal include hydrosulfite and sulfoxalate; also titanous chloride and sulfate.

TYPICAL WASHING FORMULAS ———Table V lists a few sample formulas that are typical of the industry. The number of suds used varies with conditions of soiling.

In all of these methods success is dependent upon the amount of mechanical action that is obtained when a loaded washer revolves at from 20 to 26 rpm varying with the diameter and rib heights. Simple stirring of colored swatches in a beaker, using comparable temperatures and concentrations of washing supplies, will *not* produce the same results as are obtained in actual laundering. The use of AATCC accelerated wash fastness testing methods and the development of the Accelerator indicates how important the factor of mechanical action is to soil removal.

TABLE V

SAMPLE WASHING FORMULAS

Operation	*Water level (inches)*	*Temp (°F)*	*Time (mins)*	*Supplies*
White Cotton Load				
Suds	8	130	5	Soap and alkali
Suds	5	150	10	Soap and alkali
Suds	5	160	10	Soap and alkali
Suds	5	160	10	Soap and alkali; add sodium hypochlorite
Rinse	12	hot	3	
Rinse	12	hot	3	
Rinse	12	hot	3	
Rinse	12	140	3	
Sour	5	120	5	Fluoride sour to pH 5.0
Blue	12	100	5	Blue
White Greasy Loads				
Suds	6	180-200	20	Sodium orthosilicate and wetting agents, such as Triton X 100
Follow with a sufficient number of 3-minute high-water-level rinses to remove all traces possible of sodium orthosilicate and wetting agent.				
Sour	5	110	5	Fluoride sour to pH 5.0
Light-Colored Cotton Loads				
Suds	8	100	5	Soap and alkali
Suds	5	120	10	Soap and alkali
Suds	5	120	10	Soap and alkali
Suds	5	120	10	Soap and alkali
Rinse	12	120	3	
Rinse	12	120	3	
Rinse	12	120	3	
Rinse	12	100	3	
Sour	5	100	5	Fluoride sour to pH 5.0
Acetate, Rayon, Chemical Fibers and Blends				
Suds	5	100	5	Low titer soap and alkali or synthetic detergent
Suds	5	100	5	Low titer soap and alkali or synthetic detergent
Suds (if needed)	5	100	5	Low titer soap and alkali or synthetic detergent
Rinse	10	100	3	
Rinse	10	100	3	
Rinse	10	100	3	
Sour	5	90	5	Fluoride sour to pH 5.0
Wool and Wool Blends[1]				
Suds	12	90	5	Low titer soap and alkali or synthetic detergent
Suds	12	90	5	Low titer soap and alkali or synthetic detergent
Rinse	12	90	3	
Rinse	12	90	3	
Rinse	12	90	3	
Sour	12	90	5	Fluoride sour to pH 5.0

[1] In order to minimize the tendency for wool to felt, it is necessary to stop the revolving cylinder while water is being added or the load drained.

CURRENT LAUNDRY-TEXTILE TRENDS AND PROBLEMS

CHLORINE-RETENTIVE RESIN FINISHES ——— The number one textile-laundry problem with cotton fabrics today is the reaction of the chlorine-retentive finishes and sodium hypochlorite, both under home-and commercial-laundry conditions. It is our experience that the tendency to form chloramines, which break down to form hydrochloric acid during pressing, does not occur when the hypochlorite addition is kept initially within 100 ppm. During several years of experience, the Institute's Laundry Department has never had a case where tendering of this type developed as a result of its *normal* washing procedures. However, several cases of serious tendering have developed where resin-treated cottons have been laundered under *home* conditions with bleach and then finished on a laundry press at 100 pounds steam pressure (theoretically 338°F at the surface).

There have been cases, too, where chlorine-retentive-finished cottons have been washed at home with hypochlorite, worn, and then sent to the laundry, where the item was washed but *not bleached*, and still, with pressing, hydrochloric acid was formed on the laundry press, thereby degrading the materials.

It is the belief of our laboratories that, even though laundry press temperatures are well below those of home-use electric irons, commercial drying is more thorough, and therefore hydrochloric acid is formed more easily. With thorough dryings, the same thing would happen with the hotter settings of electric irons.

Our technicians therefore are of the opinion that:

1) The problem is caused by the use of higher concentrations of sodium hypochlorite than are recommended by the Institute, namely 2 quarts of a 1% stock NaOCl solution per 100 pounds of white work.

2) The use of hypochlorite under home conditions is likely to be less well controlled. (Overbleaching is common).

3) Higher concentrations than 100 ppm available chlorine also may be encountered in stain-removal treatments.

4) The chloramines that develop frequently decompose to form hydrochloric acid less readily with hand electric irons under home conditions because drying is less thorough and uniform than it is on a laundry press.

5) Resin-treated cotton washables may be washed under home conditions and also pressed; the article then may be sent to a laundry weeks later and washed *without hypochlorite* only to have hydrochloric acid form during the more thorough, but lower-temperature drying cycle on a laundry press. (Contact with the hypochlorite solution, however, would have occurred during home washing prior to the item being sent to a laundry).

EMBOSSED DESIGNS———Embossed designs on cotton obtained with the use of suitable resins, followed by curing at elevated temperatures, have presented serious finishing problems to the laundry industry. Such articles often cannot be machine pressed without creasing and flattening the embossed design. Air or tumbler drying leaves too many undesirable wrinkles. About all that can be done is to press the article inside-out by hand on a softly padded ironing board or on a drycleaning press.

RUBBER-BACKED WASHABLE RUGS AND BRAS———On occasion, rubber-backed washable cotton throw-rugs have ignited following the laundering process. No trouble in this regard occurs during washing or extraction. Spontaneous combustion fires have occurred, however, following drying. One theory of the cause of the problem is the catalytic effect of traces of copper or manganese upon rubber in the presence of heat. The trouble, when it occurs, is confined only to certain rugs. Laundryowners have been warned to use the following safety precautions at all times:

1) Never allow a hot, dried load of rubber-backed rugs to remain stationary in a tumbler at the end of the drying cycle. Open the rugs and let them cool.

2) Never place hot, dried rubber-backed rugs into a truck or basket and permit them to be stationary. Again, open them up to cool.

3) Never wrap dry hot rubber-backed rugs.

A similar problem has been observed in the case of rubber inserts in bras, a number of which have developed tumbler fires recently. Manufacturers are advised to avoid the use of copper or brass fittings in the processing of rubber for this purpose.

HEAT-RESISTANT ELASTIC WEBBING———Work conducted at the Institute during 1949-50 with elastic webbing *(1, 2)* showed clearly that rubber can be seriously affected by repeated exposure to tumbling or pressing temperatures. For example, in one instance it was observed that an old-type elastic webbing could be tumbled with a 5-pound load 38 times, using a 6-minute drying period, and show a loss of only 20% in elasticity. However, when the tumbler drying time was increased to 20 minutes for the same 5-pound load, only 2 drying cycles were required to reduce elasticity by 20%. Similarly with the use of a press at 338°F (theoretical surface temperature), the same elastic webbing could be washed, extracted, and pressed 100 times for 30 seconds, but only 9 times if drying time was increased to 75 seconds, and develop a 20% loss in elasticity.

In comparison with this former low useful life cycle, a more modern heat-resistant rubber used in elastic webbing was washed, extracted and pressed 250 times for 50 seconds each and still did not show a 20% loss. In more recent tests in cooperation with the Elastic Fabric Manufacturers Institute, 60 competitive heat-resistant elastic webbings were laundered and tumbler-dried 70 times in a 10-pound tumbler load for 30 minutes, usually well beyond the useful life of an undergarment, if wear is taken into consideration. None of the 60 webbings showed a 20% loss in elasticity in 70 30-minute tumbling dryings. Rubber chemists have accomplished much in this field.

DRYCLEANING OF COTTON———The drycleaning of cottons has attracted considerable attention during the past several years with the trend towards using higher moisture contents in the drycleaning process. This ordinarily has caused no competitive problems for laundryowners, since in nine cases out of ten, on an average, he already is in the drycleaning business himself. If the customer wants a cotton garment drycleaned, it will be done. Otherwise, depending upon styling and construction, it will be washed.

Based on past experience, however, it is possible that in the case of white cotton work or fabrics having white areas the white article, without the use of a suitable bleaching agent, gradually may become gray after repeated cleaning treatments. This possibility is predicated on the fact that white cotton, washed repeatedly without bleach, does gradually become gray *(3)*. The proper addition of sodium hypochlorite whitens cotton loads perceptibly without important tensile strength loss. Further, the addition of three times the concentration of NaCl solution recommended does not materially increase whiteness retention, but does increase the tensile strength loss. See Table VI.

Incidentally, a white cotton article that shows readings of 85 to 92% in comparison with an original of 100% is extremely gray.

SOLUTION-DYED ACETATE AND VISCOSE ——— The trend towards the use of solution-dyed acetate and viscose to improve color fastness has been watched with interest by the laundry industry. For many years fast blacks have been obtained by adding carbon black to acetate dope prior to spinning. Courtaulds of England has produced spun-dyed viscose fibers since 1938. Advantages of solution-dyeing include

1) Exceptional fastness to light, washing, crocking, perspiration and bleeding. Reds are reported as being less satisfactory in this respect.

2) Freedom from end-to-end and selvage-to-center shading in solid shades.

3) Medium and heavy shades are obtained more cheaply with solution-dyeing than with conventional dyeing methods.

Physical-chemical properties of spun-dyed acetate and viscose are the same as for the undyed fibers.

Without question, laundries are encountering solution-dyed fibers in curtains, draperies, comforters, shower curtains, and perhaps in upholstery fabrics. No unusual laundering problems have been observed.

TABLE VI

COMPARATIVE WHITENESS RETENTION AFTER 20 REPETITIVE WASHINGS
(Original Taken as 100%)

Cotton fabric	*Weight per square yard (oz)*	*After 20 Launderings*		
		no bleach	*2 quarts per 100 pounds*	*6 quarts per 100 pounds*
1	2.8	91.3%	97.5%	97.6%
2	4.9	83.5	92.0	91.1
3	2.9	87.4	93.5	93.6
4	2.2	91.0	96.4	97.0
5	1.6	92.5	96.3	97.0
6	2.9	90.2	94.3	94.9
7	5.0	84.4	91.3	91.7
8	4.2	89.9	98.2	98.4
9	4.6	85.8	91.8	93.6
Average	..	88.4%	94.6%	95.0%

PILLING OF RAYON BLANKETS ——It has been observed that rayon blankets frequently tend to pill. In some cases pilling has been serious enough to cause consumer complaints. The problem has developed even though the rayon blankets have been handled just as if they were wool, at low temperatures and with reduced mechanical action.

ARNEL —— The commercial development of Arnel cellulose triacetate is being watched closely by the laundry industry. Laundries are particularly interested in the reported higher melting point of the triacetate in comparison with diacetate. "High-lights" and "shining" are common pressing problems with washable diacetate articles, which have no sharp melting point, but soften on a hot head press. Arnel's reported melting point of 570°F should prove to be advantageous. Anticipated uses include gabardines, challis, children's, women's and men's wear, sportswear, and knit goods.

RAYON IN TUFTED RUGS —— The interest of the commercial laundry industry in cotton and washable rugs is self-evident, since the large 42" x 84" and 42" x 96" washers of many laundries are ideally suited for handling 9' x 12' and 12' x 15' as well as smaller rugs.

With large washers and extractors, few if any laundering problems are encountered. The rugs are classified by color and washed with a series of 10-minute suds at 100°-120° F, followed by the usual series of rinses and souring to pH 5.0.

The rugs then are extracted. If small, they may be tumbler dried. If large, they are hung on poles and air dried. If a laundry is equipped with a large enough conditioning tumbler, a 10-minute run improves the appearance of the tufted surface. Large rugs, while hanging to dry, may be brushed or vacuumed. When a conditioning tumbler is not available, a 5-minute run in the washer without water will raise the pile.

The chief laundering problem encountered with such rugs is shrinkage, particularly in the case of wall-to-wall types. This is understandable since the rugs themselves are not preshrunk prior to sale. Usually careful stretching, when the laundered rug is relaid, overcomes the problem. Many laundries refuse to handle jute-backed washable rugs (unless rubber-backed) or those containing twisted paper, except with the express consent of the customer.

Based on reports of the Carpet Institute, Inc, in 1954 estimated tufted rug and carpeting production over 4' x 6' in size exceeded 30 million square yards. In 1951 estimated production was only 6.1 million square yards. In addition, the 1954 production of cotton rugs and bath mats (4' x 6' or smaller) was 23.3 million square yards.

Man-made fibers are coming more and more into the tufted carpet field. The Carpet Institute, Inc, further estimates that the consumption of man-made fibers in tufted carpets has increased from 1 million pounds in 1951 to 40 million pounds in 1954, and that it is possible that about two-thirds of the broadloom tufted carpets produced in 1954 contained rayon, acetate or nylon.

THE CHEMICAL FIBERS

The so called "chemical fibers" also have been termed by some as the "science fibers." Certainly they are not the "miracal fibers" that some publicists have contended. However, they do have many useful attributes and are welcome additions to the family of fibers that are available for man's use. Noncellulosic fiber output in 1954 was 346.1 million pounds (Textile Economics Bureau), 14½% above the 1953 production. This was counter to the drop in the use of all other fibers that occurred in 1954.

The chemical fibers may be classified as follows:

Nylon Polyamide Fiber

Nylon 66 was developed in 1938. It is formed by heat-melt reaction between hexamethylene diamine and and adipic acid. The formed polyamide is melted, extruded into air through spinnerets, and then stretched to increase its tensile strength. Nylon, like rayon, is a generic term and is not trade-marked.

Nylon 610 also is made by a heat-melt reaction between hexamethylene diamine and, in this case, sebacic acid. It is used in the manufacture of toothbrush bristles, etc, because of good rigidity.

Nylon 6 is derived from caprolactum. It was originally produced in Germany as Perlon L. Nylon 6 was first made commercially in the United States in 1954.

Dacron Polyester Fiber

Dacron is made by heat-melting and condensing terephthalic acid and ethylene glycol and then polymerizing the product to form polyethylene terephthalate. It originally was developed in England in 1941 as Terylene.

Orlon Acrylic Fiber

Orlon is made by dissolving acrylontrile (vinyl cyanide) in dimethyl formamide and extruding through spinnerets into warm air. The solvent is evaporated and recovered, leaving Orlon fiber. The filaments formed are spun and stretched to increase their strength.

Dynel Acrylic Fiber

Dynel is an acrylic copolymer made up of 40% acrylonitrile and 60% vinyl chloride. The copolymer is dissolved in acetone and then dry spun into warm air by means of extrusion, the acetone being recovered for further use. The filaments are cut into suitable staple lengths.

Acrilan Acrylic Fiber

Acrilan is a copolymer of 85% polymerized acrylontrile and 15% vinyl acetate. The powdered copolymer is dissolved and forced through spinnerets into a coagulating bath to form the fiber.

X-54 Acrylic Fiber Creslan

X-54 is a copolymer of acrylonitrile and methyl methacrylate. It still is in the experimental stage and is not yet on the market, although it may be by 1956.

CHEMICAL FIBER LAUNDERING PROBLEMS TO DATE

NYLON——The first of the chemical fibers to be placed on the market was nylon. This fiber has been defined as "a long chain synthetic polymeric amide, which has recurring amide groups as an integral part of the main polymer chain, and which is capable of being formed into a filament in which the structural elements are oriented in the direction of the axis."

Nylon is widely used as a monfilament in construction of hosiery. Nylon more recently has been used in "stretch-yarn" types of hose. The polyamide fiber has been used too, in the construction of satins, taffetas, marquisettes, curtains and in blends with other fibers for sportswear and dress goods. Recently it has been offered to tufted carpet manufacturers. Industrial uses include commercial laundry nets and press cloth, tire cord, rope, filter cloth, sail cloth, work clothing, tarpaulins, parachute fabric and shrouds, cloth for holding armor for troops, and plane fuel cells. The first successful commercial run of paper made wholly from nylon fibers was announced in August.

Annual US nylon productive capacity has been estimated at 278 million pounds, 53 million pounds being nylon 6, derived from caprolactum. Trade reports indicate that Chemstrand is planning to increase its nylon productive capacity from 50 million to 88 million pounds annually.

Nylon laundering problems that have been encountered include the following:

Some of the original 100% nylon garments that were offered by cutters to the public (for example, closely woven shirts) proved to be uncomfortable to the wearer. Consumer satisfaction increased when nylon was blended with cotton and rayon and also with the use of skip dents.

Some nylon washables have poor seam strength.

Puckering of seams in nylon shirts, uniforms,

etc, has affected the appearances of washables.

Spun nylon hose, with repeated wear and laundering, may develop pilling.

Some nylon fabrics are so slippery that, when placed on a press buck, the article slides off before the steam-heated head can be brought into contact with the material.

Marking inks containing cresol or phenol cannot be applied directly to nylon without damaging the fiber.

In the case of nylon, the centrifuge should only be brought to speed, after which the power should be cut off immediately to avoid the formation of permanent wrinkles.

White and lightly colored nylon washables quickly pick up bleeding colors from other materials being washed at the same time.

Repeated pressing of white nylon at elevated temperatures grays and yellows the fibers.

ORLON——The current popularity of Orlon "wash-and-wear" suits and slacks has been of interest both to launderers and drycleaners. Trade reports indicate that, although only 40,000 wash-and-wear suits were placed on the market in 1953, 1955 production could equal more than 3 million items. Tests at the Institute indicate that, with good tailoring methods, puckering of seams can be eliminated. Also it has been observed that pressing usually becomes necessary in time, sometimes as soon as after the third or fourth laundering.

Other Orlon laundering problems include:

Graying and yellowing of white Orlon with repeated pressing. White Orlon fleece coats may yellow during tumbler drying.

Yellowing of white Orlon when subjected to high concentrations of alkali, especially if the unneutralized alkali is pressed into the fabric.

Tumbler drying of Orlon pile-fabric coats has caused shrinkage in the total length of such garments.

Extractor wrinkles will form if Orlon washables are centrifuged for too long a period.

Some Orlon blends with other fibers have shown poor fastness to washing and to perspiration.

Orlon-wool blends, unless they have been properly heat-set, may develop progressive shrinkage with repetitive pressing on a hot-head press.

So-called Orlon "permanent" pleats frequently require touch-up to eliminate "fluff-dry" appearance.

Women's washable Orlon sweaters proved popular in 1954 and 1955. Twenty-five million sweaters, according to National Knitted Outerwear Association, were produced in 1954, and 1955 figures are expected to be good also. Acrilan is expected to be a heavy competitor with Orlon in this field.

According to 1955 trade reports, Orlon production is being increased from 30 million pounds to 39 million, with the possibility that further expansion may occur in 1956.

DYNEL ——— Dynel frequently is blended with other fibers and used in the manufacture of pile fabrics, blankets, socks, sweaters, draperies, etc. Cotton, rayon, acetate, and wool are commonly used as blending fibers. In 1954 the entire output of Vinyon N (Dynel filament) was converted to solution-dyed staple. Fibers of exceptional fastness to light, washing, crocking, bleeding and perspiration are produced. It is estimated that some 6 million pounds of Dynel were used in 1954.

Laundering problems encountered with Dynel include:

Fusing, if articles containing Dynel come in contact with too hot an iron or press-head. Dynel hose can be dried only on hot-air forms and *not* on the closed 100-pound pressure type. Dynel blankets with rayon bindings cannot be touched-up with a hot iron. Dynel fuses at an acetate setting in many hand irons. Hot-head presses should be avoided. Drycleaning presses normally may be used.

Dynel washable items generally wash well, but troubles sometimes are experienced. Light colors may become dull or "muddy" in appearance due to attracted soil. Grease and graphite types of soil have been observed to be attracted by Dynel pieces being washed in a load.

Repeated tumbling of Dynel fabrics may cause them to shrink and light colors to darken.

Extractor wrinkles may be a problem. When laundering Dynel, the extractor should be brought up to speed, after which the power should be cut off at once.

ACRILAN ——— The annual productive capacity of The Chemstrand Corp to produce Acrilan is reported to be 30 million pounds. Little of this acrylic fiber has reached launderies as of today. However, Acrilan has been used to compete with feathers and Dacron in the manufacture of pillows and in the construction of ladies sweaters in competition with Orlon. Acrilan also is being used in the manufacture of blankets, knitted outerwear, men's slacks, and work clothing.

The early output of Acrilan developed "fibrillation," a defect which now has been overcome. Acrilan is reported to blend well with other fibers and, like the other acrylics, has good resistance to chemical degradation, moths, mildew, and sunlight.

CRESLAN (X54) ——— This acrylic fiber of the American Cyanamid Company, at the moment, is largely experimental. None has reached laundries in washable items.

Still another acrylic experimental fiber, M-24, is being investigated by Tennessee Eastman, as is a new polyester fiber designated "S-50."

Celanese, likewise, is experimenting with its Fiber 32, which is reported to be indentical with the German fiber Perlon U. Fiber 32 is a melt-spun polymer of a condensation of hexamethylene diisocyanate and tetramethylene glycol.

DACRON ——— DuPont's polyester fiber is highly resistant to laundry detergents, sodium hypochlorite, and sours. If the fiber has been adequately heatset to prevent shrinkage, pressing at 100 pounds psi normally is satisfactory. Controlled heat setting above 375°F should materially reduce shrinkage on a press.

Dacron has good wrinkle-recovery properties, and for this reason frequently is blended with fine worsteds in men's lightweight suitings. Some have estimated the annual production of Dacron at 35 million pounds.

Dacron is being used in suitings, shirtings, blouses, curtains, sweaters, socks, sewing thread, sail cloth, ropes, industrial belting and fire hose. It also is being used under the name Fiberfill in the manufacture of pillows. Blended with wool, Dacron also is being used in the manufacture of men's hats.

Problems experienced with washable Dacron items include:

Heavy soil-lines at the edges of cuffs and in the fold-line of collars of men's shirts.

Pilling.

Extractor wrinkles; bring extractors only up to speed and then cut off the power.

DuPont technicians report that an overnight soaking at room temperature or a 30- to 40-minute soaking at 130 to 140°F in alkaline solutions, followed by thorough washing, will remove this soil line. Recommended concentrations of alkali solution are:

Sodium orthosilicate	5 to 10%
Sodium metasilicate	10 to 15
Sodium metaphosphate plus sodium metasilicate (50:50)	17 to 18

Following the soaking treatment the Dacron article may be rinsed (optional) and then brushed with a soft brush using bar soap. This treatment is required when the soil line has been heavily ground in from hard wear. Sewing threads able to withstand the process are nylon, Dacron, and cotton. Rayon and acetate do not withstand the high alkalinities required, namely, pH 12.0 to 12.5. Care must be taken to avoid forming permanent wrinkles with Dacron.

BLEACHING YELLOWED AND GRAYED NYLON

If white nylon has become gray or yel-

low due to the effect of heat, the following treatment, which has been developed by DuPont technicians, is recommended for brightening the fibers:

1) Wash the article thoroughly with soap or synthetic detergents by hand or in a washer.
2) Add one gallon of hot water (160°F) to an enamel container and dissolve a package of Rit Color Remover or a similar quantity of sodium hydrosulfite. Add the wet and yellowed articles. Stir and maintain this temperature for 30 minutes.
3) If discoloration is removed, rinse thoroughly; otherwise treat for an additional 30 minutes. Avoid temperature above 160°F in order to prevent the formation of permanent wrinkles.
4) Into one gallon of warm (not hot) water add 2 tablespoons of Clorox (5% NaOCl solution) and 2 tablespoons of a synthetic detergent.
5) Soak the stained article for 30 minutes, stirring constantly. Rinse thoroughly in warm water.
6) In the final rinse add a tablespoon of an optical bleach to 1 gallon of water. Optical bleaches that are satisfactory include Pro-Nyl, Gippy, Nylon-U, etc. Dry and iron with a steam iron or on a drycleaning press.

CONCLUSION

The laundering of soiled flatwork and wearing apparel may not sound particularly interesting or romantic. Still the art of laundering, like that of drycleaning, has become extremely technical and is an important segment of the American economy. The Bureau of the Census in 1954 reported that 6,206 power laundries were in operation in 1953, having a total annual sales volume of $898.4 million. In addition, the 1953 sales volume of the so-called "self-service" laundries totaled an additional $117.6 million dollars. Total employment is well over 230,000 people.

Scientific progress within the great textile industry always is of interest to the service trades, whose daily job is to launder or dryclean the textile merchandise produced by American mills. The interest shown by textile technicians in recent years in the matter of launderability is most pleasing to the service industries.

LITERATURE CITED

(1) AIL Technical Bulletin 392A, "The Pressing of Elastic Webbing" (1950).
(2) AIL Technical Bulletin 402, "Dry Tumbling of Elastic Webbing" (1950).
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QUESTIONS AND ANSWERS

QUESTION: At what temperature would printed cotton goods be washed, and would you use chlorine?

ANSWER: If they contained white areas, they would be washed with a hypochlorite. Otherwise, the white becomes gray, and we have customer complaints. You should take this into consideration with any cotton fabric containing white areas. The shirting trade has learned this from experience, and we have very little difficulty with shirting for that reason.

Q: Have you noticed any real difference in experimentation between agitator and tumble-type washers in ability to get the things white? What about wool blankets?

A: In the commercial laundry we use only the tumbler and ribbed-type washers. We have to take precautions for electric blankets and other wool blankets. We use low temperatures and high water levels, and we stop the machine during filling and draining periods. We recommend anything that will reduce mechanical agitation.

Q: Would you tell me the reason for a sour?

A: Our laundries sour because of bicarbonate alkalinity in water supplies. Out in the Mid-West, if we do not, and with 2, 3, or 4 hundred ppm of bicarbonate alkalinity, particularly in starched work, loads become yellow during the pressing cycle. We must sour to pH 5.0. In the New England and Pacific Northwest areas, souring is far less important than it is in the Mid-West.

Q: What concentrations of available chlorine would you use for bleaching these cottons?

A: Our recommendation for years has been two quarts of a one percent solution for a 100-lb load, which gives an initial concentration of 100 ppm. My guess would be that, where higher concentrations are used, there would be more chlorine-retentive damage.

Q: Do you know of any published guides which give the maximum safe temperatures at which various fabrics can be laundered?

A: We have service bulletins which are available to those interested.

IV—COLOR AND FINISHING PROBLEMS IN DRYCLEANING

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The primary purpose of this paper is to point out some of the more pronounced problems the public is encountering with fabrics in their end use, and to suggest means by which they may be minimized or eliminated.

The consumer who supports the industry which makes and processes fabrics has many complaints about what he buys, wears, and uses. Many of these complaints are warranted because they involve negligence, carelessness, and poor judgment of one phase or another of the textile industry—either in the manufacturing and processing end, or in the servicing end.

Philadelphia Textile Institute, under a fellowship arrangement with the Pennsylvania Association of Dyers and Cleaners and another with the Pennsylvania Laundry Association, has undertaken the task of analyzing some of these problems and establishing their origin. In the solution of many of these problems, it is necessary to draw from the combined knowledge of textile men, weavers, dyers, drycleaners, launderers, and chemists.

Specific examples of certain problems—common and novel, are shown and suggestions made as to how such problems can be avoided. The avoidance or minimizing of these problems will make for a more satisfied consumer, and a better quality of consumer goods.

INTRODUCTION

MANY claims are made and many more thousands of words are written about today's fabrics. In far too many instances all that is said about fabrics, in advertising or otherwise, is not necessarily true. Misstatements and false claims might not be intended, but the unbounded imaginations of advertising copy writers have a way of ignoring facts. In addition, slip-ups in manufacture, in dyeing, printing, spinning, weaving and finishing processes, do occur. The slip-ups result in problems when the fabric makes its appearance in consumer end uses, and during renovation. When these problems occur, Mr & Mrs Consumer complain, and with considerable right, about what they buy and use.

The common objective of all who manufacture, market or renovate textiles is professed to be, and rightfully should be, a satisfied consumer. Thus, failure of a fabric to give service, or to live up to its advertised quality and claims, whether the fault be with construction, dyeing or finishing, is certainly good reason for consumer complaint.

The research staff of the Philadelphia Textile Institute, through a fellowship established by the Pennsylvania Association of Dyers and Cleaners, is conducting a continuous study of fabric failure problems to determine causes and establish, if possible, their origin. Fabrics and garments of all types are renovated by the member plants of this Association in all types of drycleaning processing systems. Whenever fabric-failure problems are encountered they are submitted to the laboratories at the Philadelphia Textile Institute for analysis and evaluation. More than a thousand such experiences were submitted during the past year. This, of course, is not the sum total of all problems experienced by these major plants, but they do represent the outstanding ones, or those that form a definite pattern of the major difficulties.

From over four thousand such problems examined and analyzed in our laboratories, certain general types of damage are catalogued as occurring very frequently. Many of these pin point shortcomings in manufacture — in dyeing and printing processes, and in finishing. These processes are the responsibility of the manufacturer. Some of the more pronounced of these failures, which are encountered by the consumer in end use and during renovation, will be pointed out in this paper. A solution of such problems, or a decided minimizing of them, will contribute much toward obtaining this much-desired consumer satisfaction.

DISCUSSION

What are these problems? Where do they originate? How can they be avoided? Direct answers to these and similar questions are not always possible, but there is usually a logical reason for, or an explanation to most of them.

COLOR DIFFICULTIES———Let us begin with color difficulties and take a very recent problem involving a dyestuff — or perhaps more accurately — the dyer. A quick glance at a window display in a busy shopping area today is sufficient to show that one of the most popular colors of the moment is a particular shade of blue, known variously as Alcian Blue, Monastral Blue, or Mediterranean Blue. This color, in varying shades, is applied to different weight fabrics of many weave types. It is in dresses, gamps, blouses and a whole variety of casual clothes, such as ladies shorts, pedal pushers, etc. It is most popular on cottons.

The problem with this dye is usually encountered after the garment has been drycleaned and pressed. Ofttimes a good portion of the color is removed during the drycleaning operation, and those areas where abrasion is greatest show the most color loss. Thin white lines that appear as "breaks" and patterns resembling "crows feet" are very prominent. When the garment is returned to the customer it certainly does not have that "like new" look, and the first reaction is to blame the drycleaner for "ruining" the article. He might suggest that faulty dye or dyeing was the cause, and that the dress be returned to the store where purchased for examination. Reputable stores would be expected to be anxious to determine the cause of such damage, but many refuse to take any responsibility. They too are satisfied to pass the blame to the drycleaner. In many retail store circles, drycleaners are generally referred to by various uncomplimentary names. When this sort of buck-passing situation is developed textiles really have a genuine problem.

What is the answer? We must get to the basic cause of the trouble. Presupposing that the dyestuff is good and *can* give excellent service, the answer must lie in the method of application. A dispersable pigment, for example, requires methods of application that will insure penetration and proper fixation of the dyestuff if crocking is to be avoided. Mere surface application and improper fixation of the dye has been the case in all of the damaged fabrics we have examined. The dyer has been the culprit, not the dye, and not the drycleaner. It is a manufacturing defect or error, and the responsibility should be accepted by him, and him alone.

It is our belief that poor penetration and surface dyeing usually result when the material is jig dyed. We believe that best results on piece goods are obtained by padding, which assures better penetration. This should be followed by treatment with soda ash at elevated temperatures (180-200°F) to obtain proper fixation of the dyestuff. The excess color should then be removed by soaping with a detergent to insure prevention of further or subsequent color removal during wear or renovation.

SOLUBILITY OF DYES IN STANDARD DRYCLEANING SOLVENTS——— A second problem in our list of those that plague the drycleaner is that involving dyes that are soluble in standard drycleaning solvents, ie, petroleum and chlorinated hydrocarbons.

Certain Rapidogen and other azoic dyes are partially soluble in drycleaning solvents, but Rapidogen prints, eg, printed ginghams, are quite popular for ladies' dresses. During drycleaning, some of the Rapidogen prints are removed entirely, leaving a white or yellow garment. Others will lose a large percentage of color. When one piece of a two-piece garment is drycleaned and the other wet drycleaned, as might be dictated by soil present, the drycleaned piece has an entirely different shade of color from the piece that was wet drycleaned. The dyestuff is lost because of its solubility in drycleaning solvents.

The drycleaner frequently is blamed for this damage when actually the responsibility rests elsewhere. It results from a poor choice of dyestuffs. Solvent-soluble Rapidogen, or azoic dyes, in view of the end use to which the fabric will be put, should never be used on fabric that is intended to be, or likely to be, drycleaned.

The high styling and details of construction in cotton dresses is causing more and more of them to find their way to professional drycleaning establishments. This fact should be recognized and taken into consideration by the textile industry when dyestuffs are selected for current cotton fabrics. Style garments should be drycleanable, or dyers, fabricators, and designers had better develop and use a "DO NOT DRYCLEAN" label. When solvent-soluble dyestuffs are used on fabrics that are likely to be drycleaned, manufacturers should assume full responsibility for color damages that ensue.

RESIN-BONDED-PIGMENT PRINTS ———Still another of the color problems relates to the resin-bonded-pigment prints. In addition to use in ladies dresses, much of this type of fabric is used in drapes and slip covers. Resin bonding agents

slowly but progressively dissolve in all drycleaning solvents, somewhat more rapidly in chlorinated solvents than in Stoddard solvent. Both types of solvents, however, eventually soften and dissolve the binder, and when this happens, the pigment print is removed in varying degrees. This again is a manufacturing defect insofar as serviceability for consumer end uses is concerned. If pigment prints are to be satisfactorily serviceable a more stable bonding agent will have to be found and used.

FAULTY COLOR CHOICES FOR DRAPE FABRICS IN PRINTED DESIGNS——Some vat colors, especially certain yellows, oranges and reds, in many and varied combinations, very often are the cause of holes and fiber degradation in drapes. Light exposure and exposure to atmospheric fumes accelerate the destructive action of these dyes and the fabric. Such dyes should be avoided for use on fabrics that might be exposed to sunlight. Weakened and degraded fibers cannot be noticed in advance of drycleaning, but they are there. The damage becomes apparent after the adhering soil has been removed and the mechanical agitation during drycleaning has caused the degraded fibers to separate and open up to form shreds and holes. The drycleaner is faced here with a problem that is not of his making, and over which he has no control.

TOPPING —— Topping is an accepted general practice in the dyeing profession, but overtopping (using a questionable dye to reach shade) can cause considerable trouble for the drycleaner. Certain direct colors and some basic colors are used disadvantageously — much more often than most dyers will admit. When, as is very often the case, one piece of a two-piece garment is cut from a bolt of fabric which did not require topping, and the other piece from a fabric that was overtopped, the drycleaning and any necessary spotting might readily remove some, or all, of the topping dye, thus producing a nonmatching two-piece garment. Must the drycleaner be shouldered with responsibility for this? Obviously, he is not responsible. What will the textile industry do to minimize or stop this faulty practice?

"TWO-COLOR JOB" —— The sixth item on our list is a very common type of damage, and a very-long-endured one, which makes its appearance as a two-color job on men's trousers, usually the summer weights made of acetate and rayon blends. Trousers frequently turn up with one side of the trouser leg considerably different in shade from the other side. The color difference begins sharply at the crease. Color destruction is often greatest at the knee area, or the thigh, areas that have been exposed most to perspiration. The damage results from the degradation of dyestuff, accelerated by perspiration salts, and a peculiar property of many acetate dyestuffs to break down when repeatedly heated, as would be the case in pressing. In the pressing operation the dyestuff sublimes, making the color loss wilder in pattern and more apparent. The drycleaner is left with a disturbing and serious problem. It certainly is a dyestuff weakness involving a poor choice of dyestuff in consideration of the use to which the fabric will be put. The manufacturer, if he is really seeking to obtain consumer satisfaction with textiles, must give more consideration to the end uses to which a fabric will be subjected. For example, where perspiration is likely to be encountered, the effects should be weighed. There is nothing the drycleaner can do to avoid this problem. He can't predict which trousers will give trouble. The consumer cannot be told not to perspire. Thousands upon thousands of garments have developed this type of damage, and an even greater number of consumers have experienced dissatisfaction in the use and renovation of such garments and have not registered their complaints. Who pays the bill in this type of damage? Generally the drycleaner, occasionally the store from where the garment was purchased, perhaps most often the consumer. The damage should rightfully be assumed by the manufacturer. Its cost will ultimately be paid in terms of lost business. The problem is one that belongs to the textile industry, and should be shouldered by it, and solved by it.

FINISHES——In the field of finishes, the problems are myriad. The number of types of finishes being put on fabrics is reaching staggering proportions. Resins by the score are being employed to impart various properties. Many fabrics are reaching the cutter and fabricator of garments with water-soluble sizings, much to the discomfort of the drycleaner as well as the consumer. Heaven help the woman who gets caught in the rain, or who dares to perspire while wearing a garment having such a sizing. If she spills a foodstuff on the garment, moisture is required to remove the stain. In removing the stain the drycleaner creates another problem — that of resizing the garment, which he can usually do readily. If, however, the fabric shows a dimensional change because of poor construction originally covered up by the sizing, he might have two problems instead of one.

Solvent-soluble resins and sizing applied to give "wrinkle resistance" and "permanent" pleating character to fabrics are often soluble or partially soluble in drycleaning solvents. They may be removed in the drycleaning process, resulting in the "permanent" pleats being very "unpermanent." The advertising copywriter, in this case, has failed to tell an important part of the story — that the garment should not be renovated if it is to keep its "permanency." This, of course, applies also to other advertised claims.

Many of the resin applications to fabrics are good, and help the fabric to offer excellent service in use. But even the good ones can go wrong, and when they do there are serious problems for the drycleaner. In the curing of melamine- and urea-formaldehyde-type resins, improper curing time or temperature of the curing cabinet can result in the development of extremely disagreeable odors in the fabric when subjected to solvent immersion during drycleaning, or in the presence of moisture. The drycleaner cannot control or eliminate this fabric fault, nor should he be held responsible for it. But he certainly can get into trouble with it.

CONCLUSIONS

The illustrations recounted in this paper do not cover the full field of difficulties encountered by drycleaners in their contacts with textiles. But they do point up the existence of serious problems of which the textile industry must take note. They emphasize also that more "up-to-the-minute" test methods should continue to be sought to better predict the end-use experiences with textiles, methods that would disclose more of the problems which have made their appearance to the drycleaning industry.

If the objective of "consumer satisfaction" is to continue to be the goal of the textile industry in its quest for successful enterprise, it behooves all elements in its complex make-up, from fiber manufacturer through consumer services, to participate in a plan that will have each segment assume full responsibility for honestly and accurately determined errors of practice and procedure. It must cooperate in selling performance all along the line. It must not let the consumer hang in the air "holding the bag."

Such is the plan, and the goal of the fellowship of the Pennsylvania Association of Dyers and Cleaners at the Philadelphia Textile Institute. The textile industry is invited to make use of the facilities of the Institute in any effort to find solutions for practical problems that face the consumers of its products.

V—GARMENT DYEING IN THE UNITED STATES TODAY

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A discussion of wholesale garment redyeing, its methods, its problems and some of the solutions is presented by the author.

He discusses the progress of dyeing from early days, the place of redyeing from the consumer standpoint, the equipment required in a modern plant, natural and synthetic fibers and their identification.

He describes the four principal methods of dyeing, ie, direct, union, developed and vat, and explains the difficulties of processing some of the new synthetics, particularly when they are in combination with natural fibers.

The article gives useful mechanical information and outlines proper temperature ranges for the successful handling of specific fibers and mixtures and also offers several specific formulas for dyeing various types of Orlon and blends.

The author closes with a plea to manufacturers for greater assistance to the service industries in technical aid on solving textile maintenance difficulties.

INTRODUCTION

FROM the day that man first began wearing clothes, he has continually sought better ways to add color to his apparel. And from the first dyeing with vegetable and mineral colors to today's complex dyeing, dyestuff chemistry has come a long away.

Until the early nineteen twenties, the cleaner and the dyer had simple problems. Cotton, wool and silk were the main textiles they saw, and it was necessary only to find the proper coloring matter and apply it correctly.

Then the scientist began competing with Mother Nature, and his synthetic fibers have made the life of the cleaner and dyer a complex matter indeed. Where many cleaners formerly doubled as dyers, in today's complicated procedures, the cleaner is glad to leave the difficult task of dyeing to skilled dyeing specialists.

PURPOSE

The garment redyeing industry serves a very special purpose in today's scheme of things. It is garment dyer's job to change or renew colors in apparel or furnishings to extend the useful life of the product.

He is called upon when the item's original color has lost its appeal or has succumbed to a changing style; or when the ravages of time, wear, and the elements have taken the life out of the color with fading; or, as frequently happens, when a spot or stain does not respond to cleaning. Among the many unusual requests a garment dyer may receive are rush orders to process mourning clothes; also frequent calls are received for renovating family heirlooms, much as a valuable old photo might be retouched.

EQUIPMENT

Symbols of the garment dyer are the traditional copper kettle, dipper and spoon. And despite today's technological advances these simple tools of the trade are still very much in evidence in even the most modern plant.

However, machinery is taking over more and more as fabrics become more varied and problems become more difficult.

Rotary dyeing machines are used more than any other type. They are used with a single pocket or multiple pockets, and some are compartmented. Depending on the type of work, the speed may be constant or varied from 5 to 15 rpm. Size of cylinder also dictates the speed employed.

We also use paddle machines and the relatively new open-end washers for small lots.

The newest aid to dyeing is the high-temperature rotary machine, which I will discuss later.

FIBERS AND IDENTIFICATION

To the traditional wool, cotton and silk, recent years have seen the addition of nylon, acetate rayon and viscose rayon. More recently, and gaining in importance, we have Orlon and Dacron as well as Vicara, Acrilan and Dynel.

It has been a fairly easy matter to identify the first group with a burning test. The newer synthetics do not lend themselves to such tests and identification is often difficult. Stain tests are not adequate because few garments are received uncolored. When color is present, it complicates identification.

When the unknown fiber or fibers can be successfully separated, we can usually detect it with a suitable solvent, such as dimethyl formamide for Orlon.

FOUR PRINCIPAL DYEING METHODS

DIRECT———Under this heading we can list the substantive colors for cotton and also the neutral-dyeing acid colors and milling colors for wool. Both are used in large quantities for the bulk of the work processed. Some garment dyers prefer to mix these two classes of dyestuffs in preference to using union colors on wool.

There is slightly more control and less waste when direct colors are employed. In redyeing a woolen garment, for instance, there is only a small percentage of cotton to be covered, and the use of union dyestuffs is far more costly than use of a combination of direct and neutral-dyeing acid or milling colors.

UNION—Union dyestuffs are preferred by many garment dyers because of their superior ability to cover sunfaded woolen garments evenly. This classification consists of direct colors that dye wool and cotton to a solid shade.

In one of the most recent pieces of work done on the redyeing of faded woolen garments *(1)*, it was found that solid dyeing direct colors of low basicity applied at a pH between 6.5 and 7.0 and at a temperature between 175 and 185°F gave the best results.

Although the selection of the proper dyestuff seems to be the prime factor, there are also many excellent retarding and leveling agents that can be used.

Naturally, the one-bath union method is more economical than the older process of acid dyeing, which dyes the wool in one bath and then cross dyes the cotton in another. Less handling of the goods effects a considerable saving in time and labor.

In addition to dyeing many garments of mixed wool and cotton, the dyer must also provide coverage for rayon and acetate linings. When this happens, there must be coverage for three different fibers in the same bath. It is not unusual for the dyer to have to cover more than three fibers in a single bath.

DEVELOPED ——— Developed colors are not used beyond a limited extent by garment dyers in the US today. Acetate

garments received for black are developed in almost all plants; many of them also develop their acetate navy blue. In certain instances cottons are developed, usually when special fastness specifications are required.

VAT———More and more vat redyeing is being done by garment dyers. Hospitals and institutions require unusual and specific fastness for their work and that is best achieved by this method.

PRINCIPAL DYEING AUXILIARIES

Many chemical dyeing assistants have been found to be extremely helpful in the redyeing processes. Processing not only of garments, but household goods and rugs as well, is benefitted by the use of chemical assistants. Optical bleaches come into this category. So do sequestering and stripping agents, vat stripping assistants, water softeners, agents for reserving, retarding, leveling, wetting and penetrating. Sizings and softeners also contribute to the production of a finer, more natural-looking finished article.

MAIN PROBLEMS

The problem of sun fading of woolen fabrics always has been troublesome, but it rapidly is becoming less so. Careful selection of dyestuffs and the use of leveling and retarding agents in the dyebath are producing more successful results.

As always, the service industries are plagued with a vast quantity of unserviceable material. The consumer, cleaner, laundry and dyer are all encountering merchandise that simply will not give the normal wear or life expectancy that the owner should expect.

In addition, trim and accessories may add style touches to a garment, but they bring gray hairs to the cleaner or dyer who finds them distorted or practically dissolved after processing.

Also, many garments have been dyed originally with dyestuffs that run badly in any wet processing or drycleaning.

We, along with many other dyers around the country, received a vast quantity of summer cottons recently. This group had been dyed originally with a fast-to-light turquoise of the phthalocyanine type. Fastness to perspiration and wet crocking, however, was extremely poor. Ordinary household washing caused lost color at points of rubbing. No washing instructions were labelled on these garments, yet the cleaner or laundry who handled them received the blame that should have gone to the manufacturer.

The manufacturer too often does not consider the service problem of his ultimate buyer, with the result that the laundry and cleaner may have to call on the dyer to correct a color lapse that is really the manufacturer's fault.

These problems, annoying as some of them are, do not come close to ranking with the new difficulties of redyeing man-made fibers, especially Orlon. Dacron, Acrilan and Dynel are not far behind in being troublesome.

The difficulty lies in the resistance of these fibers to ordinary dyeing techniques. But the customer is not interested in our technical problems. He expects his garment to wash or dryclean properly. He also expects a change or renewal of color if he so desires.

In the late 40's, the first noticeable flow of Orlon garments began coming to our plant. This was the continuous-filament Orlon known as type-81, which was practically impossible to dye at that time. We did somewhat better with the staple (type-41) Orlon by using the cuprous-ion method. But at atmospheric pressures, only medium shades could be obtained.

With the copper method, any metal trim present became tarnished or destroyed. Wool trim had to be removed. If this could not be done, redyeing was not possible. We could use basic dyestuffs but depth of shade was highly limited.

Type-42 Orlon has since supplanted type-41, and this accepts color more readily. Nonetheless, any unusual condition of wear or manufacture makes redyeing more difficult. For example, an Orlon garment containing excessive perspiration will be hard to redye evenly near the boil. This can be overcome by redyeing at high temperature with either the cuprous-ion method or basic colors.

Combinations of Orlon or Dacron with wool or silk create further complexities. Here again high temperatures give the best dyeing in the shortest effective time. However, certain fiber combinations, such as silk and type-81 Orlon, cannot be redyed to a medium or heavy shade as the silk may be damaged by the copper method.

High temperatures, even though producing better color yield than dyeings up to the boil, create mechanical problems. The garment may show a distortion due to shrinking of cotton' stitching, trim, backing or even zipper tape. Men's suit jackets will show a puckered lapel because of the shrinkage of the inner stiffener material.

We must use high temperature on most Orlon garments received for redyeing because most requests are for the heavier shades. To keep shrinkage to a minimum and obtain a fast dyeing cycle, we find that the best temperature for type-42 Orlon is from 212 to 220°F. Type-41 and type-81 require 230 to 250°F. For the past year we have been using a Gaston County 50-pound rotary high-temperature machine. This machine has a single pocket. Although the speed can be regulated, we find that 6 rpm is adequate for most of the synthetics we receive.

Types-41 and 81 do not tend to shrink as much at these high temperatures as does type-42. In order to dye type-42 to black in a reasonable time cycle, the copper method must be used. Not only must the temperature be checked carefully, but the amount of copper sulfate on the weight of the goods must be controlled as closely as possible.

8 to 10% of copper sulfate is a safe limit. This goes up to 10 to 12% on types-41 and 81, because there is not as much danger of shrinkage as with type-42.

The recently developed cationic colors and certain of the basic colors are excellent for light and medium shades on type-42, with best results obtained at high temperatures. At 212 to 220°F, these dyestuffs are adequate to produce all full shades except black.

Garments of Dacron blended with cotton or rayon have been comparatively simple to dye at high temperatures without a carrier. But it has been more difficult to redye wool-Dacron blends to heavy shades, especially black.

At the present time the Technical Committee of the Garment Dyers Guild is working on the use of various carriers on wool-Dacron blends. These dyeings are being carried out both at temperatures above the boil (from 212-220°F) in high-temperature equipment and also in conventional rotary equipment bringing the temperature as close to the boil as is possible. At present the carrier showing the most promise is methyl salicylate. After redyeing with most carriers, lengthy and careful scouring must be done in order to prevent crocking or carry-over of the odor of the carrier.

Typical formulas for redyeing Orlon and Dacron garments at high temperatures are presented below:

Type-42 Orlon (with no wool present) redyed black

Prepare bath with:
10% Copper sulfate
0.5% sodium nitrate
5.0% DuPont Anthraquinone Blue SWF Conc 150%
5.0% DuPont Orange RO
1.5% Roracyl Dark Brown B

Enter load at 180°, run 5 minutes. Add 2½% sodium bisulfite. Close machine and bring to 218° F as quickly as possible. Run 20 min at 218° F. Cool and rinse.

Type-42 Orlon and Orlon-wool blends, navy blue

Prepare bath with:
0.5% acetic acid (56%)
0.3% sodium acetate
0.5% Emulphor ON-870
0.70% Malachite Green
0.30% Fuchsine

Enter load at 180° F, close machine and bring to 218° F as quickly as possible. Run 35 min at 218° F. Cool and rinse.

100% Dacron and/or Dacron-rayon blends, navy blue

Prepare bath with:
0.29% Acetamine Fast Yellow 4RL
6.0% Latyl Violet BN
1.58% Latyl Brilliant Blue 2G
0.20% Latyl Orange R

Close machine and bring to 250° F. Run 30 minutes at 250° F. Cool and rinse.

CONCLUSION

In summing up, I speak both for myself and for the garment redyeing industry as a whole. From the experience of our own plant, as well as the accumulated and exchanged information of many other dyeing plants, I think I can show as clear a picture as possible of the place of the garment dyer in the United States in 1955.

In 1947, we faced the growing complexity of our problems and the need for concerted effort to meet new conditions as they arose while at the same time maintaining a high level of quality. A representative number of plants across the country organized the Garment Dyers Guild of America. Meetings and technical clinics are held in member plants several times a year. The Guild has provided a fellowship at the Philadelphia Textile Institute and work is now being done on the major problem of redyeing garments containing the new synthetic fibers.

From this work, both personal and combined with fellow members of the industry, we are doing what we can to face the sudden influx of new fibers and their new problems . . . to serve the manufacturer, other service industries and the consumer with quality, first-class redyeing.

The consumer is still the big boss, however. Of course he is slightly bewildered today with all of the new items of wearing apparel he sees on the market. Many of them are being efficiently shoved down his throat with the use of exaggerated claims made in advertisements. Who is responsible for the shortcomings of these lofty promises? Strangely enough everybody involved with the servicing of these garments seems to carry the ball for the manufacturer of the fiber and the garments. He is on the sidelines watching everyone else struggle with his "hot potato."

Our campaign will continue to try to find better ways of redyeing these hard-to-handle materials. At the same time we hope the manufacturers of synthetic materials and the makers of all types of garments will strive to produce products that can be properly redyed so that the public will get the service and use they are entitled to have.

ACKNOWLEDGMENT

The author thanks Gordon Hacker of the Gaston County Dyeing Machine Co for the use of two experimental rotary, high-temperature dyeing machines.

LITERATURE CITED

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VI—CLOSING REMARKS OF THE CHAIRMAN

W J MOONEY

Pennsylvania Association of Dyers and Cleaners

I want to conclude this morning's session, ladies and gentlemen, by saying that we in the service industries are very grateful to the Program Committee of the AATCC at this convention for the recognition of our industries in their relation to the whole scheme of textiles.

We hope that the AATCC will keep its interest in our end of the industry and repeat the performance in years to come.

I am inspired by that one admonition we all have had at one time or another in our lives—the maxim from the teachers, that if we want to climb to the top of the mountain we must one day begin. To my mind, this program today is the beginning that may come to fruition in later years and be of value to the textile industry and to us who serve the consumer. All of us are interested in that problem and have that one objective.

I want to thank the members of the group at the table, Miss Furry, Mr Johnson, Mr Parsley, and Mr Teichner for their papers this morning.

I said, in my introductory remarks, that if we in the service industries have a place in this complex organization of the textile industry, we are necessarily at the end of the line. At that end of the line, of course we sweat and toil over the mistakes that are made in the whole run of the thing, from the creation of the fiber to the fabrication of the garment. We have come here today, and we may sound like complainers. We have given our complaints, but we have done it with the intent of inspiring you to realize that there are problems in this end use of the things you make, and that if we are to successfully turn them into dollars in a good enterprise, you must be concerned with them.

You must open more fully those lines of communication with us in order that we might cooperate in finding solutions for the problems, in such activities as are carried on in all of the service industries, in the American Institute of Laundering, the National Institute of Drycleaning, the Dyers Guild of America, and in all of the other associations of launderers, cleaners, and dyers.

Take our criticism in good vein and consider our problems over the years. Cooperate with us in solving them.

I want to apologize, to some extent, at least, for the criticisms we do level. I am reminded of a story by George Jessel that I think is appropos to the sort of criticism that we give. He was telling a friend of the time that he took a colossal Hollywood movie magnate to serious task, pointing out that the way the man was running his studio was bad, that his recent pictures lacked box office appeal, and that his publicity and promotional programs could not be more inept. The friend with mouth open and listening to how Georgie had dressed down the magnate asked, "What happened?"

Jessel said, "Nothing. We parted good friends. He boarded his yacht and I took the bus home."

That is about the way we feel now. But we don't want you to board your yacht and let us ride home on the bus. Let's get together and travel the road with each other and make some accomplishment out of the little effort we have given here this morning. Thank you.

AATCC Committee Reports

Report of the AATCC Washfastness Committee——

ACCELERATED WASHFASTNESS TESTS AS SUITABLE END-USE TESTS FOR CONSUMER GOODS

P J FYNN, *Chairman*

THE first washfastness tests developed by the American Association of Textile Chemists and Colorists (Test 36-54) were primarily designed to discriminate between different dye classes. The procedures were not intended to predict behavior in laundering and the results obtained with their use do not approach the effects produced by conventional home or commercial laundry conditions. They give the effects produced solely by the temperature, alkalinity and bleaching conditions that prevail in the tests, and these only approximate actual laundering conditions.

About 1945 the Washfastness Committee took cognizance of the fact that end use washfastness tests were needed because the tests then used (Test 36-54) were too mild to predict the color destruction actually produced in laundering, especially in the case of pigment prints. Work was undertaken on a new series of studies which eventually resulted in the present "accelerated" tests.

There have been a few occasions since the development of the AATCC Accelerated Washfastness Tests (Test 61-54) when the question has been raised as to whether it would not be advisable to include another test to be run at a temperature of 140°F. In each case the Washfastness Committee has discussed this proposal and, on the basis of the history of the development of the Accelerated Washfastness Tests and on the basis of the results obtained from these tests in various laboratories, the Committee has decided each time that there was no necessity for a new intermediate test in the present series.

In developing the accelerated test series the first group of colors tested were those of good fastness to washing in hot water. These were the basis of the 3A test. Forty-one samples belonging to this dye classification were washed in commercial laundries throughout the country and in six laboratories by home washing procedures. The average amount of color removed in the laboratory washings and the commercial laundries was established statistically, and this median amount of color removed was used by the Association's research staff as a reference standard in developing a laboratory test which would correlate with the results of actual laundering under regular conditions. The laboratory test procedure as finally developed was run at 160°F in order to obtain an amount of color removal in one test cycle equivalent to the median value for five commercial launderings. This median value for color removal was produced by five commercial laundry washings at a temperature which never exceeded 120°F and using a moderate alkalinity and a running time of approximately one hour for each washing cycle. The same amount of color removal occurred in an electric home washer with moderately alkaline built soap at a temperature of 140°F.

From this it appears that the rate of color removal from a fabric is determined by the total action of the various factors which enter into a washing process, the most important of which are time, temperature, rate of mechanical action, alkalinity, soap and bleach concentration. The temperature differences between the 120°F light-colored fabric formula of the commercial laundry and the comparable laundering at 140°F in the home washing machine, which produced the same color washdown, show that temperature is an important but not a controlling factor in color removal.

For the 4A test, the median amount of color removal was established by subjecting a series of appropriately dyed fabrics to white work washing formulas in several laundries. These washing formulas were run at a maximum temperature of 160°F and the fabric was bleached using two quarts of one percent available chlorine bleach per 100 pounds of load, the quantity specified by the American Institute of Laundering.

The 2A test was developed from the color washdown results obtained on a series of appropriately dyed fabrics, which were laundry washed at 100°F with neutral soap. The accelerated laboratory methods that were developed for both the 2A and 4A tests produced an equivalent color loss to that produced by the five commercial washings in the corresponding formulas used in laundry practice.

The Accelerated Washfastness Tests are what the name implies. They are tests designed to produce in forty-five minutes the amount of color loss which would normally be removed by five consecutive commercial or home launderings. It is evident that, in order to accomplish such a result, the test method must be more severe in certain characteristics than the washing method to which it is related. This is the basic reason why the temperatures employed in the tests are in excess of the temperatures occurring in the actual laundering formulas.

In conclusion, the effects produced by the three accelerated washfastness tests correlate well with the results from the three types of washing formulas generally used in commercial or home laundering, and on this basis there is no need for a test intermediate between the 2A and the 3A test. Furthermore, the tests as written provide for five steps of color removal within each test so that it is possible to accurately specify the washfastness of any color by this system.

As a comment on the suitability of these tests for consumer end use tests, they have been adopted as a basis of minimum standards programs by the Shirt, Pajama and Sportswear Manufacturers Association and the American Standards Association standards for Institutional Textiles (L-24) and have been proposed for Textiles (L-25).

Report of the AATCC Committee on Damage Caused by Retained Chlorine——

SUMMARY OF THE POSITION OF THE COMMITTEE

COMMITTEE

L L Walmsley, American Viscose Corp, chairman
R F Aurich, Joseph Bancroft & Sons Co, secretary
O C Bacon, E I du Pont de Nemours & Co, Inc
A C Nuessle, Rohm & Haas Co
E H Rossin, Monsanto Chemical Co
H R Bellinson, Cluett, Peabody & Co, Inc
L C Reynolds, Riegel Development Laboratories, Inc
J G Stass, Burlington Mills Corp
H Y Jennings, Dan River Mills Co
W E Belanger, American Viscose Corp
G Fox, Consolidated Laundries Corp
T F Cooke, American Cyanamid Co

DURING the past year there has been much dissatisfaction and controversy resulting from the improper interpretation and inadequacies of the Tentative Test Method 69-52 "Damage Caused by Retained Chlorine" as it presently appears in the current *Year Book* and has appeared for the past four years. In cognizance of this controversy and dissatisfaction, the Committee on Damage Caused by Retained Chlorine at a recent meeting decided that the chairman should prepare for publication a report setting forth

a) the present status of the Committee with respect to its position on the present published tentative method,

b) the difficulties the Committee is having with an unpublished revised procedure in obtaining reproducibility,

c) where the Committee stands at present, and

d) what the Committee proposes or hopes to do in the future.

The Committee on Damage Caused by Retained Chlorine had its origin in the problems arising from chlorine retention of fabrics as a result of the application of resinous materials to these fabrics. The material on which these finishes were applied in the early days was principally rayon. The problem and the basic causes were known early and many separate tests were devised. It was felt by the Executive Committee on Research of the AATCC that a committee should be appointed to study existing methods to revise any questionable procedures and, as a result of this study, to present a test method to the Technical Committee on Research.

Because of the many complaints on damage there was some urgency and, therefore, a test method was outlined which would be published as a tentative test procedure until a final method could be formulated and accepted. Thus it was realized by the original committee that the test as outlined was inadequate even for then known requirements.

Part of the early work suggested washing in accordance with known commercial laundry procedures using chlorine and testing for damage. This seemed to be the logical approach; however, this was inadequate as this method did not show damage to many materials tested although it was known that similar materials so treated were sometimes damaged in actual use. It was furthermore felt, at the earlier meetings, that a quantitative method might be devised—the percentage loss in strength after treating with chlorine and scorching and the degree of chlorine damage could thus be measured. Such a method was devised (current tentative test 69-52), but unfortunately interlaboratory tests to date have not shown satisfactory reproducibility.

During all of this test work, new fabrics were introduced that included as part or all of their construction newer synthetics, which were chlorine retentive in themselves or which, because of their characteristics, did not show damage in breaking strength. In addition, the use of resins in cotton materials became popular. It also became known that cottons processed by certain other methods were known to become chlorine retentive.

This necessitated a completely new approach to the whole problem of chlorine retention as it applied to the committee's work. It was realized that the whole test had to be rewritten including "Purpose and Scope" and "Evaluation". Before test work could begin, new test procedures and formulas had to be devised to take into account the newer problems. In order to determine in a test whether the fabric or the finish were chlorine retentive, it was necessary to set up a formula so that a control as well as a test fabric could be used. In order to test for positive identification of chlorine damage, it was essential to develop an accelerated test, for as previously mentioned, using an amount of chlorine consistant with laundry practice did not always show the possibilities of damage which indeed did exist under certain circumstances. It was realized that using an amount of chlorine in excess of common practice might prove misleading unless specifically mentioned and, therefore, the purpose and scope was changed to take this into account. In order to properly evaluate the damage, it was necessary to devise an equation for calculating damage. However, although the test method was designed to be quantitative, repeated tests have not shown adequate reproducibility among laboratories. Therefore the Committee would like to emphasize that this fact should be taken into consideration in any attempt to establish standards of chlorine retention based on percentage losses using the method as outlined in the *Year Book*.

As a result of this situation further tests were conducted to attempt to define the factors which might cause deflection from true chlorine-retention damage estimation. Based on a number of interlaboratory tests in which thirteen laboratories participated, these factors have been established to date as follows:-

1) The type and number of washings after chlorine immersion affect the pH of material prior to drying and scorching. It was found that less washing would render the fabrics less subject to damage due to chlorine retention as the effect of the damage-causing hydrochloric acid would be neutralized by the retained alkali in the chlorine solution during scorching. Therefore, the higher the pH of the rinsed fabric, the less loss might be expected after scorching.

2) The pH of the chlorine solution used as well as the age and type of chlorine solution.

3) Type of water used. It was shown that the presence of impurities had an actual bearing on the degree of damage in the chlorine retention test.

4) Location of the test sample in the fabric to be tested.

5) The use of or the omission of a wetting agent in the wetting out bath.

6) Strength test variations between laboratories. There have been serious differences between laboratories on untreated samples. Although a complete test in one laboratory might be satisfactory, even here, unless the same operator completes the test, the results may be in doubt.

7) Variation in scorching equipment. This last factor might indeed be the most important.

Tests are in work to further refine and identify the above points of variance and it is realized by the Committee that further time will be required before a reliable test procedure can be established.

During the past several months, there have been strong indications of dissatisfaction with, and improper interpretation of, the tentative test as outlined in the *Year Book*. The Committee is fully aware of and sympathetic with the problem which the current tentative test presents.

It is the hope of the Chlorine Retention Committee that, in view of the above facts, those utilizing the tentative test procedure will regard it merely as a guide.

Report of the AATCC Washfastness Committee——

EFFECTS OF SYNDETS ON COLORFASTNESS TO WASHING

P J FYNN, *Chairman*

THE rapid increase in the use of syndets (synthetic detergents) in both home and commercial laundering and the practice of including optical brighteners in the formulation of both soaps and soapless detergents used for laundering has raised the question of the adequacy of the existing test procedures for rating colorfastness of textiles that would be washed with detergents other than soap or with detergents and soaps containing optical bleaches. The American Association of Textile Chemists and Colorists' standard test procedures rating colorfastness to washing use a washing formula based on neutral chip soap (ASTM-D496). A research project was set up by the AATCC Committee on Colorfastness to Washing to determine what effect on colorfastness ratings is produced by substituting for the regular soap formula either an anionic or a nonionic detergent typical of the sudsing and nonsudsing varieties. These and the neutral soap were used both with and without an optical brightener.

A number of fabrics from commercial production, in prints and in solid shades, in cotton, rayon and acetate were used for the comparison tests. Each fabric was washed by the accelerated test procedure (AATCC Test 61-54) appropriate to the intended end use of the fabric. Some fabrics were tested by more than one procedure. All were washed with formulas prepared using three different detergents with and without optical brightener. Several of the fabrics whose dyes were thought to be more susceptible to the superior solubilizing action of syndets were given consecutive tests to determine whether or not a cumulative effect not obtained in one washing would be evident after the equivalent of fifteen launderings.

The soap and syndet formulas were prepared to the Committee's specification by the laboratory of a large manufacturer of soap products with compositions as close as possible to commercial formulations for household detergents. The syndets were of the "built" type. The optical brightener was one which exhausts in alkaline solution.

The tested materials, which totaled more than 200 mounted specimens, were all rated for four Committee members, working independently, using a Macbeth daylight lamp and the International Geometric Grey Scales. The ratings were given to the nearest one half step of the grey scale. Examination of these data disclosed that in only 23 instances (about 10% of the judgings) did the majority judgment support a difference of as much as one half a grey-scale step between the rating obtained using the standard soap formula and that obtained with any of the five variations of the formula. Eight of these twenty-three instances involved two dyeings, which carried their slightly anomolous behavior through several different washing formulas. These same two dyeings also provided the only instances where there was less color removed (less by only one half a grey-scale step) by the standard soap than by the other washing formulas. In all other cases where a difference was observed between the color change produced by standard soap and that produced by any of the other formulas, the standard soap removed slightly more color. Thus, the standard formula provides the most rigorous conditions of test and eliminates the danger of the test method occasionally passing a specimen likely to fail in use with syndets.

In the case of those samples which were given consecutive tests approximating the effect of fifteen launderings there were 84 specimens to be judged and out of these there were fifteen instances of a one half grey-scale step difference between the effect of standard soap and any of the other detergents and there were five instances of a whole grey-scale step difference. Again, where there were differences, the standard soap produced the most washdown.

These color comparisons include the samples washed with detergents containing optical brighteners. It is apparent that the presence or absence of the brighteners did not affect the tests enough to change the ratings by more than half a step on the grey scale. The brightener concentration in the formulas was the same as that found in typical household detergents.

It is emphasized that there was no attempt made in this work to evaluate the relative merits in consumer use of soaps and syndets or of optical bleaches. This work was done solely to determine the relative effects of neutral soap and typical household syndets with and without optical brighteners on the formulas used in the AATCC tests for evaluating colorfastness to laundering.

In conclusion, when the neutral chip soap specified in the American Association of Textile Chemists and Colorists' Colorfastness to Washing Tests 36-54 and 61-54 was replaced by an anionic syndet or a nonionic syndet, with or without the addition of an optical brightener, or by neutral soap with an optical brightener, the effect upon the colorfastness rating of the samples under test was not significant. It is apparent from this investigation that the soap formulas for these tests are adequate for the purpose of rating the colorfastness of textiles to current laundering practices.

News of the Trade

• Philadelphia Quartz Company — 125 Years Old

The Philadelphia Quartz Company is celebrating its 125th anniversary. The celebration was inaugurated recently by a dinner for the personnel of the various departments at the general offices, and out-of-town representatives, and dinners for the personnel at each of the company's nine plant locations.

In observing their 125 years of continuous business, the company has published a brochure entitled "Respected Friend", which tells the story of the company from its beginning in 1831 when the founder, Joseph Elkinton, a Quaker, opened a soap and candle factory at 377 South Second Street, Philadelphia. The business grew steadily and in 1855 Joseph Elkinton took his two sons, Joseph S and Thomas, into the firm.

Young Thomas showed particular interest in the technical aspects of the business, and in 1858 he set about experimenting with silicate of soda, which, he found, improved the washing action of soap. Until the Civil War the sale of silicate to other soapmakers was negligible. At that time southern rosin was not available to northern soapmakers, and silicate was substituted. The improved detergency of silicated soap was enthusiastically received by customers, and other soapmakers became interested. Today silicate is universally recognized as an important basic ingredient in soaps and synthetic detergents.

Soapmaking continued at the original plant but it became necessary to expand production for the manufacture of silicate. A larger factory was built in 1864 at 9th and Mifflin Streets, Philadelphia and it was then that the name of Philadelphia Quartz Company first appeared. By 1868 an impressive array of various silicate brands was carried in stock, attesting to many new uses for the versatile chemical. In 1889 growing business in the mid-west justified the opening of another silicate factory in Anderson, Indiana.

In 1905 the outdated silicate plant at Philadelphia was replaced by a new factory in Chester, Pa to meet the increasing demand for silicate. At this time it was decided to concentrate the entire energies of the Philadelphia Quartz Company on the manufacture of silicate. Soapmaking was accordingly discontinued.

On its 100th anniversary, the company introduced sodium metasilicate and sodium sesquisilicate in a stable, free-flowing form. In 1955, on the eve of this century-and-a-quarter mark, a new product, an amorphous, finely divided silica, was announced.

This salutation used on company correspondence since 1831 serves as a fitting title for Philadelphia Quartz Company's 125th Anniversary Brochure.

From the early days of experimentation in silicates to the modern research laboratories located at Primos, Pa, the company has issued technical informational information on the character and uses of the versatile, inorganic sodium and potassium silicates.

"Soluble Silicates, Their Properties And Uses" a two-volume publication by the late James G Vail, a former directer of the company, was released in 1952 by the American Chemical Society as its Monograph #116. It is said to be the most complete treatise on this subject ever attempted.

In addition to the Anderson and Chester units, plants today are located at Baltimore, Md; Buffalo, N Y; Jeffersonville, Ind; Kansas City, Kas; Rahway, N J; St Louis, Mo; Utica, Ill. An associate company, Philadelphia Quartz Co of California, operates three plants at Berkeley and Los Angeles, Calif and Tacoma, Wash. Another associate is National Silicates Ltd, with plant and office at Toronto, Ontario. A new plant in Valleyfield, Quebec will be constructed by the end of 1956.

Thomas W Elkinton, great grandson of the founder is president of the eastern and Canadian companies, and a director of the California company. Directors of Philadelphia Quartz Co are Thomas W Elkinton, William Martin, James A Norton, Chester L Baker, John C Russell, Charles E Ramsey, Thomas Elkinton, John H Barker, J Morris Evans. General offices are located in the Public Ledger Bldg, Philadelphia 6, Pa.

The expression "Respected Friend" has been the quaint salutation on company correspondence since the very beginning in 1831. It reflects the firm's business thinking as does another quotation which has become an unofficial "motto" for the company. It was first expressed by Joseph Elkinton to his son, whom he urged "to continue to dwell under a proper concern for the best things."

• Dates for 1956 Gordon Research Conference Set

The Gordon Research Conferences of the American Association for the Advancement of Science for 1956 will be held from June 11 to August 31 at Colby Jr College, New London, N H, New Hampton School, New Hampton, N H, and Kimball Union Academy, Meriden, N H.

The Textiles program will be held July 9-13 at Colby Jr College as follows:

July 9—"Some Recent Advances in the Chemical Transformation of Cotton into New Fibers," Wilson A Reeves and William Weaver; "Electrostatic Properties of Finished Cellulose Acetate Yarns," G J M Sprokel.

July 10—"Chemical Modifications of Wool as Related to Fiber Properties," Milton Harris and Robert Saxon; "Textured Filament Yarns," L G Ray.

July 11—"New Polymers as Potential Fiber Formers," Herman Mark; Paper by W Weltzein (subject to be announced).

July 12—"Dimensional Effects in Measurement of Textile Properties," Stanley Backer; "Glass Textile Sizes and Finishes," Alfred Marzocchi and J K Park.

July 13—"Wool Fiber Shape Factors: Effect on Fiber Properties, Processing Behavior and Fabric Properties," John Menkart.

Individuals interested in attending the Conferences are requested to send in their applications to the director. Each applicant must state the institution or company with which he is connected and the type of work in which he is most interested. Attendance at each conference is limited to 100.

Requests for attendance at the Conferences, or for any additional information should be addressed to W George Parks, director, Department of Chemistry, University of Rhode Island, Kingston, R I. From June 11 to August 31, 1956 mail should be addressed to Colby Junior College.

• NSP Acquires Additional Property in Chicago

National Starch Products Inc, has announced the purchase of several acres of land adjoining the present plant property located at 3641 South Washtenaw Ave, Chicago 32, Ill.

The acquisition of this property squares out a full city block with extended frontage on the main line tracks of the Gulf, Mobile & Ohio Railroad. Plans for expansion have not been announced.

CIBA'S NEW ATLANTA DEPOT at 534 Permalume Place, NW, is an important new link in the company's chain of facilities to serve the South. Substantial inventories covering Ciba's broad range of products will be maintained at this warehouse.

• Carbide to Expand Seadrift Production

Another step in Carbide and Carbon's major ethylene oxide expansion program has been announced by H B McClure, president of Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation. Provision for the additional production of 65 million pounds of ethylene glycol per year is being made at the Seadrift, Texas plant. This extra capacity, announced less than a year after start-up of the original plant, will bring total capacity for ethylene oxide in this single plant to more than 200 million pounds per year.

The production of ethylene oxide and the glycols from this expansion, together with the output of Carbide's plants at South Charleston, and Institute, W Va; Whiting, Ind; Texas City, Tex, and from the new plant at Torrance, Calif, is expected to provide a total supply amply adequate to meet expected market demands for some time. Completion of the new facilities at Seadrift are expected in the fall of this year. The new Torrance plant is due to start up production units this spring.

• Independent Chemical Corp to Handle Pako Mixer in 3 States

The Pako Corporation, manufacturers of the "Pako" mixer, has designated the Independent Chemical Corp as exclusive sales representative and distributor for the unit in New York, New Jersey and Pennsylvania.

The "Pako" mixer is a small, portable stainless-steel mixer of 54-gallon capacity, which works on a jet impingement circulating pump. It is said to be unique in its simplicity, there being only two moving parts: the motor and the pump.

Independent Chemical Corp has installed a working model in its warehouse and show rooms at 70-30 79th Pl, Glendale, Brooklyn 27, N Y.

Inquiries should be directed "Department K" at the Brooklyn address.

• Concord Chemical Acquires Standard Soap

The Concord Chemical Co, Moorestown, N J, has acquired the plant and major assets of the Standard Soap Co, Camden, N J, and will move its plant and offices to the new location at 205 South Second St, Camden. The acquisition was effective February 1st.

Concord will close out its operation at Moorestown, moving all manufacturing to the new address with their plant and office personnel remaining unchanged. Standard Soap Company, formerly at the Camden address, will operate as a division of Concord Chemical, also under the same personnel and management, continuing its manufacture and marketing of a line of textile soaps, cleaning compounds, and disinfectants.

In addition to its Yorkshire textile soap, Standard also produces textile wetting agents, scouring compounds, dye leveling agents, fulling compounds and textile finishes.

Concord produces waxes, primarily Carnauba and Japan wax replacements, as well as a number of specialty wax products. They also handle extensive quantities of cresylic acid each year. This work will continue and be enlarged at the new plant.

• 25th Annual Meeting, ISCC

The 25th Annual Meeting of the Inter-Society Color Council will be held in the Georgian Room at the Statler Hotel, New York, N Y on Thursday and Friday, April 5 and 6, 1956. A two-way program has been planned for the 25th Anniversary Meeting having the general title, "Color Problems in the Graphic Arts." Norman Macbeth, Inter-Society Color Council treasurer and chairman of the delegation from the Illuminating Engineering Society, is Program Chairman, and O C Holland, delegate from the National Association of Printing Ink Makers, Inc, is Chairman of the Local Arrangements Committee.

The reports of the chairmen of the delegations from the twenty-three Member-Bodies and of the various committees as well as the business session will be held on Thursday morning, April 5th.

There will be an exhibit in connection with this meeting to show equipment and demonstrations consisting of colorimeters, densitometers, lighting equipment, package design, viewers, spectrophotometers and samples of process printing. The exhibit will be open from 11:00 am to 10:00 pm Thursday, April 5th, 9:00 am to 5:00 pm Friday, April 6th.

The banquet will be held on Friday evening in the Georgian Room at the Statler Hotel followed by a new paper by Ralph M Evans discussing problems in the graphic arts.

The board of directors of the Inter-Society Color Council will meet on Wednesday, April 4, 1956 at the Statler Hotel.

Many of those attending the Inter-Society Color Council Annual Meeting will be going on to the April 7th Saturday session of the Optical Society of America which is being held at the Hotel Bellevue-Stratford in Philadelphia, Pennsylvania. Among the papers being presented at this session are the following:

Saturday Afternoon Session on Color Measurement — Deane B Judd, *Chairman*

S51. "Color Measurement and Color Appearance," W D Wright, Imperial College, London, England.

S52. "Dilemma from Zurich," D L MacAdam, Eastman Kodak Company, Rochester, New York.

S53. "New Color-Mixture Data from the National Physical Laboratory," D B Judd and K L Kelly, National Bureau of Standards, Washington, D C.

Requests for further information and advance registration may be addressed to Ralph M Evans, secretary, Inter-Society Color Council, Color Technology Division, Building 65, Eastman Kodak Company, Rochester 4, N Y.

Theodore B Hayward, vice president of the Philadelphia Textile Institute Foundation and chairman of the Building Committee, snips the ribbon at the dedication ceremonies of the new Residence Hall of the Philadelphia Textile Institute on Friday, February 3, 1956.

Pictured with Mr Hayward (l to r) are: Bertrand W Hayward, president, PTI; W Lyle Holmes, Jr, president, Archibold Holmes & Sons, and chairman, PTI board of trustees; Rinaldo A Lukens, vice president and treasurer, Continental Mills, Inc; Robert A Smith, American Viscose Corp; Harry Dalton, American Viscose Corp; Robert L Huffines, Jr, president of Amerotron, Inc and Textron American, guest speaker at the ceremonies; Richard S Cox, dean emeritus, executive secretary, and treasurer of the PTI Foundation; Frederick H Barth, Industrial Rubber Co; William A Popp, president of the Alumni Association; Leon P Brick, Onyx Oil & Chemical Co; Wayne Fry, Albany Felt Co.

• New PTI Residence Hall Dedicated

Dedication exercises for a new $600,000 Residence Hall on the campus of the Philadelphia Textile Institute, Philadelphia, Pa, were held on February 3rd at the Germantown Cricket Club and on the college campus.

Ceremonies began at the Cricket Club with an academic convocation that was followed by an address by Robert L Huffines, Jr, president of Textron American and Amerotron, New York, N Y. Mr Huffines, a graduate of PTI and currently a member of the board of trustees for the Institute, described the current relationship between textile colleges and the textile industry. He stressed the importance of continuous growth and refinement of the colleges so that the best possible graduates could be sent to the industry.

Following Mr Huffine's speech, W Lyle Holmes, chairman of the PTI board of trustees, presented Mr Huffines with the honorary degree of Doctor of Textiles. Bertrand W Hayward, president, PTI, thereupon conferred the degree.

Theodore B Hayward, vice-president of the Philadelphia Textile Institute Foundation, presented Rinaldo A Lukens, vice-president and treasurer of Continental Mills, for the honorary degree of Doctor of Textiles. President Hayward then conferred the degree.

Following these exercises at the Cricket Club, the audience withdrew to the campus of the college for cornerstone laying ceremonies, the traditional ribbon cutting, and a tour of the new dormitory facilities.

The dedication ceremonies preceded the 55th Annual Banquet of the PTI Alumni Association, which was held that evening in the Grand Ballroom of the Warwick Hotel, Philadelphia, with more than 300 in attendance.

Major General Robert P Hollis USA, commandant, Industrial College of the Armed Forces, Fort Lesley J McNair, Washington, D C, was the principle speaker. The theme of General Hollis' speech was "Government—Industry Relationship."

William A Popp, William A Popp and Associates, Philadelphia, class of '38, and president of the Association served as toastmaster.

President Hayward gave his annual "State of the College" address. In commenting on the Dedication Ceremonies he stated, "The growth of the Philadelphia Textile Institute has been made possible only through the generosity of the great textile industry of which most of you are a part. Be assured that the faculty and staff of PTI will continue to exercise every effort to merit the continued support of its industry, so that we can expand and improve our facilities and graduate to the industry the finest possible product."

Robert A Smith, American Viscose Corp, chairman of the Alumni Fund, gave a report of the annual program to date.

W Lyle Holmes was awarded a "Certificate of Merit" for his devoted service to the Alumni Association for the past 30 years. Mr Holmes has served as auditor and treasurer during this period, resigning from the latter office in June 1955.

Many classes held individual informal get-togethers at what was the best-attended PTI alumni banquet in the history of the Institute.

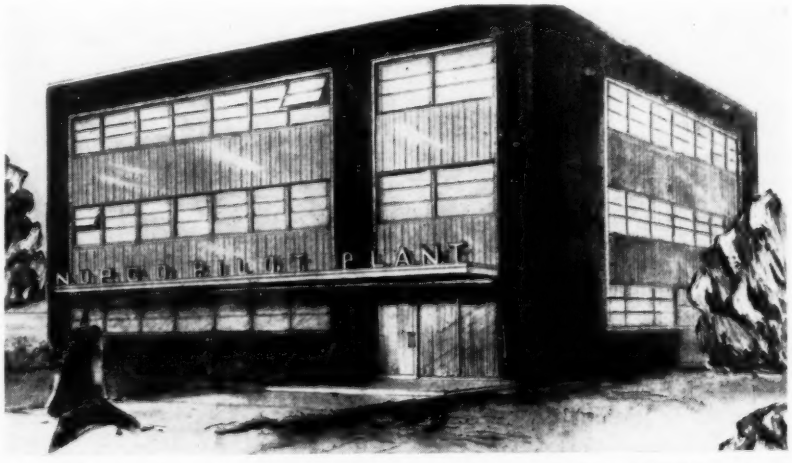
• Construction Begins on New Pilot Plant for Nopco

Construction work has begun on a new pilot plant for the Nopco Chemical Company. The new building, to adjoin Nopco's main plant in Harrison, N J, is being erected on a 10,000-square-foot site on the Passaic River front.

The structure will be the center for development work and pilot plant production of new and improved chemical specialties for the textile industry.

Incorporating the latest in architectural design, the building is being planned with an eye to maximum flexibility of interior space arrangements, to allow for future incorporation of new production and experimental research units.

Weather and other factors permitting, Nopco officials expect the new pilot plant to be ready for occupancy sometime in the spring.



Architect's drawing of pilot plant being constructed for Nopco Chemical Co at Harrison, N J

• NEW PRODUCTS AND DEVELOPMENTS •

G, R & S Clip Collector

• Clip Collector

Practically all finishing plants use small metal clips made of band steel to attach to the selvedge of goods being finished when special attention is called to some place in the selvedge. These also are used to hold out doubled selvedges. They present a problem if they are allowed to go through the finishing process attached to the cloth. An automatic way has been worked out to remove these clips before they go through certain machines. The automatic device which does this job has been christened a "clip collector" by its inventor, R V Cook.

According to Mr Cook, the device should be used before a peroxide steamer to prevent rust spots and rust holes, and in front of dyeing machines to prevent undyed spots under clip when goods are put through the dye pad. Also, they should be installed before hot air frames to prevent nicked places in the selvedge, and before Sanforizers where clips might stick to the rubber or felt blanket or latch in the Sanforizer shoes. Mr Cook has been overseer in one of the largest finishing plants in the South. He has developed other devices which are in special use in the plant where he is now employed. This plant is now using several of these "Clip Collectors."

The device itself is very simple. A powerful magnet is used to pull the clip attached to the selvedge toward a metal plate, which is usually attached to a guider, but could be placed almost anywhere. The pull of the magnet opens the clip slightly at the end and the cloth carries the partly opened clip down the edge of the plate, which is inclined at the outside edge. At the bottom of the plate the clip has been pulled entirely free of the selvedge and drops into a box. The plate is made of stainless steel. Arrangement has been made to install the "clip collector" on any type of guider. There is ample adjustment for the correct placing of the "clip collector" in any position necessary for its proper function.

Exclusive manufacture and distributor is the Guider, Roll and Service Company, PO Box 3747, Daytona Beach, Fla.

• Eversan

A new, permanent chemical finish for textiles, which reportedly will kill disease-bearing and odor-causing bacteria coming into contact with the fabric, has been developed by Yardney Chemix Corporation, 44 Leonard Street, New York.

Marketed under the trade-name Eversan, the new finish reportedly can be applied by incorporating it in bleaches, dyes, inks or resins without any addition to current processing cycles. It is said to be nontoxic and nonirritating.

Tests under laboratory and commercial manufacturing conditions are said to reveal that the new process is as long-lasting as the fabric treated, irrespective of the number of washings to which the cloth is subjected.

It is claimed that Eversan-treated fabric, soaked in highly contaminated solutions, will return to 99% + sterility within four hours after removal from contamination, without washings or attention of any kind.

• Pyrazol Fast Blue FLL

Information on Pyrazol Fast Blue FLL, from Sandoz Chemical Works, Inc, 61 Van Dam Street, New York 13, N Y, states that this is a greenish blue fast-to-light direct color which combines very level dyeing properties with the maximum economy. Fabrics dyed with Pyrazol Fast Blue FLL are said to show little or no change in shade or light fastness after resin treatment. For applications where resins are not used, fastness properties are more than adequate, it is claimed.

• Norane Silicone

Warwick Chemical Company, division of Sun Chemical Corporation, has announced the addition of a new product, Norane Silicone, to its line of water-repellent textile finishes. This new concentrated emulsion of silicone resin is designed to produce a durable water repellent and non-oily spot- and stain-resistant finish on acetate, viscose, cotton, nylon and wool fabrics.

According to H C Whittemore, vice president and general manager of Warwick, "fabrics treated with Norane Silicone will not only show improved properties of abrasion resistance, tear strength and sewability but fabrics treated with Norane Silicone will hold their press, resist wrinkling and stay new looking longer with less care." In addition, it is claimed that Norane Silicone is compatible with thermosetting resins for durable-water-repellent, crease-resistant and shrinkage-control finishes.

The Warwick Chemical Cooperative Advertising Plan which covers other Warwick water-repellent finishes, such as Impregnole, Norane W, and Norane 4-Star, will be extended to include Norane Silicone. According to Mr Whittemore, a combination Warwick-Dow Corning garment hang tag will be made available to garment manufacturers for fabrics which meet the standards of the Warwick Chemical-Dow Corning Certification Plan.

• Emersol 213 Low Titer Elaine

A new single-distilled oleic acid, Emersol 213 Low Titer Elaine, has been added to Emery Industries' line of fatty acids and derivatives. This new grade is identical to the standard Emersol 211 Low Titer Elaine except for a lighter color as follows: *Emersol 213:* 5y/1R—10y/2R (1" Lovibond); *Emersol 211:* 10y/3R—30y/6R (1" Lovibond).

With its price equal to that of Emersol 211, it is suggested that the new grade should offer considerable advantage to users of single-distilled oleic acids that can benefit from a lighter color.

The narrow color specifications on Emersol 211 reportedly will remain unchanged to provide continued uniformity of color for the many uses where a lighter color is undesirable.

Both Emersol 211 and Emersol 213 are available in tankcar quantities, carload and ton lots in standard 55 gallon drums. For price quotations, contact the Chemical Sales Department, Emery Industries, Inc, Carew Tower, Cincinnati 2, Ohio.

• Dow Corning T-31

A new, practical finish for heat-cleaned glass cloth used in structural laminates has been developed by the Dow Corning Corporation. Identified as Dow Corning T-31, it is said to be effective with epoxy, phenolic, polyester and silicone resins, enabling laminators to meet a wide range of specifications with a single type of finished glass cloth.

A solution of silicone in methyl cellosolve, one part of Dow Corning T-31 may be diluted in 60 to 80 parts of water for application in conventional finishing equipment. It is claimed that no washing, neutralizing, or curing is required—just dip and dry.

Priced in the range of $6.00 per pound, Dow Corning T-31 is estimated to add about 5¢ per yard to the material cost of finished glass cloth. Research samples and further information are available on request from Dow Corning Corp, Midland, Mich.

• Isomal 265

A new anionic surface-active agent known as Isomal 265 has been developed which reportedly can be used in the processing of textiles as a wetting agent, rewetting agent, penetrant, detergent and emulsifier. It is said to be specially formulated to reduce processing time and increase processing efficiency.

The new fluid, developed by The Johnson-March Corp, 1724 Chestnut St. Philadelphia, is a concentrated sulfonated ester-type liquid. It is said to have exceptional characteristics and to be unusually versatile and efficient.

New manufacturing techniques give Isomal a lower surface tension than any other similar product, with unmatched wetting and rewetting properties, it is claimed.

It is reported by the manufacturer to have a broader range of solubility in water and nearly all organic solvents than ever before possible with any surface-active agent. It is said to be easily dispersed in alcohol, acetone, petroleum solvents, oils and chlorinated solvents in practically any type of application.

Clear in appearance, Isomal 265 has a neutral pH factor and a specific gravity of 1.088 at 60°F. It is approximately 65% active and mildly pleasant in odor.

High operating efficiency reportedly is obtained from a unique balance of lipophilic and hydrophilic elements. The solution is said to be compatible with both nonionic and other anionic agents, to be stable at elevated temperatures (up to 210°F), and to have no upper or lower cloud point.

FABLOK INDUSTRIAL NET BAG FEATURES ZIPPER CLOSURE——Featuring the convenience of a top zipper closure, this new industrial nylon net bag by Fablok Mills, Inc, Irvington, N J, is described as an etxra time and cost saver for industrial users such as textile dyers, laundries, institutions and drycleaners.

The nickeled-silver Conmar zipper is clinched to heavy nylon tape and is said to be resistant to oxidizing effects of chemicals and cleaning fluids, such as Stoddard Solvent and perchlorethylene. The zipper also includes a brake-lock that prevents opening and loss of contents while processing.

The bags are supplied in three stock sizes: 18" x 24"; 24" x 30" and 30" x 36". The knitted nylon net construction is said to be run-and-snag resistant, yet light in weight for easy handling and storage.

• Change in CSI Pilling Tester Brush Board

A change in the material of construction on the pilling tester sponge and nylon brush boards is planned by Custom Scientific Instruments, Inc, Kearny, N J. Laminated wood, similar to that now used in the base and table of the unit will replace the plywood boards presently used. This change is expected to eliminate any possibility of these boards warping. No price change for the pilling tester is anticipated.

Two changes have been made in the sample boards to aid the technician in use of the tester: rubber tubing now covers the sample rods and screen door hinges have replaced the old type fasteners to give more positive pressure in holding the sample fast.

• Nopco Issues New Product Bulletin

The Nopco News, the first of a series of quarterly product bulletins was recently issued by the Market Development Department of the Nopco Chemical Company, Harrison, N J. The bulletin is devoted to new Nopco products developed for a specific market, but having widespread applicability to other industries.

Information on the following products is included:

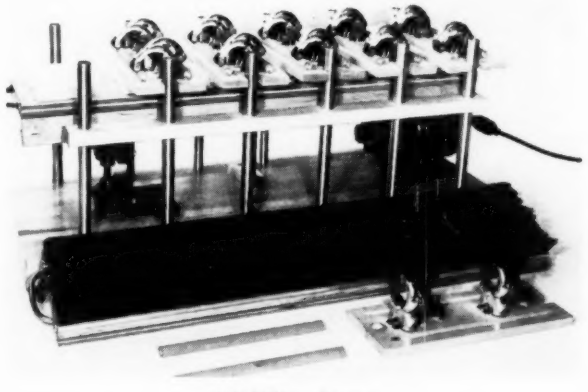
Nopco GS-10, a hydroxylated aliphatic amide that has physical properties similar to glycerine. Suggested uses include: a softener and plasticizer of cellulose, internal plasticizer for thermosetting urea and phenolic resin formulations in molding rubber latex goods, etc.

Nopco 1525-L, 100%-active liquid surface-agent of the nonionic type. It is a polyoxethylene ether of an alkylated phenol polymer. Suggested for use as a textile softener and antistatic agent, as a detergent for dry cleaning, as an alkyd resin emulsifier, etc.

Nopcoset B, a modified polyvinyl acetate emulsion of the anionic type. Suggested for use where quick tack is required.

Nopco 2221-P, a modified ester of castor oil. Suggested for use as a rayon yarn finish ingredient and as a mineral oil soluble derivative.

For further information write to Dept DM, Nopco Chemical Company, Harrison, N J.



CSI Pilling Tester

NAMES IN THE NEWS

Committee D-13 on Textile Materials of the American Society for Testing Materials will present the Harold De Witt Smith Memorial Medal to ARTHUR G SCROGGIE of E I du Pont de Nemours & Co, Inc, at a ceremony on Thursday, March 15, during the Spring Meeting of the Committee D-13, at the Hotel Warwick, New York.

The medal is a testimonial to the memory of the late Harold De Witt Smith who pioneered in the concept of an engineering approach to the evaluation of the properties of textile fibers and to their utilization. It was endowed by Fabric Research Laboratories, Inc, Boston, and is awarded at intervals of not less than one year by Committee D-13 for outstanding achievement in research on fibers and their utilization. This is the seventh time the medal has been awarded.

Dr Scroggie is manager of the Characterization Laboratory of the Textile and Industrial Products Research Division of Du Pont's Textile Fibers Department. He joined the company in 1928.

VICTOR S SALVIN, Summit Research Laboraories, Celanese Corp of America, has completed a two-week speaking tour of the South under the sponsorship of the American Chemical Society. He delivered talks before local ACS sections in Virginia, the Carolinas and Florida on "Dyeing of Synthetic Fibers."

WALTON C FORSTALL, formerly quality control superintendent in the Amsterdam, N Y, plant of Bigelow-Sanford Carpet Co, has been named assistant manager of Grossman Industrial Properties, Amsterdam.

In his new position Mr Forstall will be active in the maintenance of the former Bigelow-Sanford Mills and in promoting their occupancy by diversified industries.

HAROLD E ABBOTT has been appointed assistant to the sales manager of Ultra Chemical Works, an associate of Witco Chemical Co. He will handle product and sales promotion, as well as special assignments.

After serving 10 years on the sales force of Richards Chemical Works, Mr Abbott formed his own concern, Abbott Chemical Co.

N A RUSTON, director of development and service for Emery Industries, Inc, Cincinnati, O, retired on February 1 after 26 years of service, including the last 14 as a director. He will continue to serve the company in a consulting capacity.

W T MEINERT, who joined Emery's Development and Service Dept seven years ago, moves up from the post of assistant director to succeed Mr Ruston.

R G KELSO, formerly with Carbide & Carbon Chemicals Co, and RICHARD H PROCTOR, formerly with Fischer Scientific Co, have joined the sales staff of Emery's Chemical Division.

Goldberg

Wurzburg

Eastman

National Starch Products has announced the advancement of A I GOLDBERG, and O B WURZBURG, JR to be associate directors of research.

Dr Goldberg joined National in 1947. He has been active in the resin field.

Otto Wurzburg has been specializing in starch research for National since 1939.

Also announced was the appointment of FRED EASTMAN as superintendent of process development. He has been with National since 1939.

H W Butterworth & Sons Co, Bethayres, Pa, has announced the retirement of J HILLMAN ZAHN, manager of their Southern office in Charlotte, N C, effective April 1.

Mr Zahn is retiring after 43 years with the Butterworth organization. With J Ebert Butterworth, now president of the Company, he opened the Southern office in 1923. He was made manager of the office in 1936.

During his long associattion with the firm in a sales and service capacity, Mr Zahn has also made important contributions to the design of Butterworth wet finishing machinery. He has been a proponent of machinery operation in range. He was in large measure responsible for the success of many of the early Butterworth finishing ranges in the South.

Mr Zahn will continue to live in Charlotte and will be available to Butterworth in a consulting capacity.

The appointment of M GILBERT HOPKINS as manager, Textile Machinery Division, Rodney Hunt Machine Co, Orange, Mass, has been announced. A ROBERT CONNOR, former manager, has been appointed to the newly created post of technical director, Textile Machinery Division, and will be engaged primarily in research and development of new textile machine products and processes.

Mr Hopkins has been connected with the Textile Machinery Division since 1938. In 1949, he was appointed textile machinery sales engineer in charge of the company's Philadelphia office, covering Pennsylvania and other Mid-Atlantic states.

Ruston

Meinert

Kelso

Proctor

Zahn

Hopkins

Lange

Knowland

Pact

Gannon

Perriello

King

JOSEPH SAMUEL LANGE and DANIEL POWER KNOWLAND retired on December 31, 1955 after a combined service of 80 years with Geigy Dyestuffs, Division of Geigy Chemical Corp. They were honored at a dinner given by over 150 of their colleagues at Fraunces Tavern in New York on Thursday, December 29th.

Mr Lange joined Geigy in 1921, becoming sales manager shortly thereafter; but as he neared retirement age he returned to "first love" — direct selling. He began his career in the dyestuff industry with the German firm of Kalle & Co at the age of 16 as office boy and successively went through laboratory training, was advanced to chief clerk and following his graduation from the Pratt Institute evening course in 1906 he became a salesman. At the outbreak of the first World War, when German dyestuff supplies were cut off, Mr Lange and a few friends began the manufacture of dyestuffs under the firm name of the American Color Manufacturing Co in New Jersey. This organization was purchased several years later by the Newport Chemical Works, which subsequently was absorbed by E I du Pont de Nemours & Co, Inc.

Mr Knowland, following his graduation from Lowell Textile School in 1907, was selected to become an apprentice in the Volontar-Abteilung of Leopold Cassella & Co, GmbH, Frankfort O M, Germany. After more than a year of training, he returned to the United States and became a dyer at the Ipswich Hosiery Mills. Following this service he joined Dexter Richards Co in Newport, N H as boss dyer and later became chemist for McClary, Wallen & Kraus, now Mohawk Carpet Mills division of Masco Inc. He joined Geigy on January 1, 1911 and rose to chief chemist, which position he occupied at the time of his retirement.

When dyestuffs were cut off from Europe during World War I, Mr Knowland, with limited plant facilities available, was placed in charge of dyestuff manufacture and continued producing much needed color until the start of the Cincinnati Works, now Toms River-Cincinnati Chemical Co.

Mr Knowland has taken a most active part in the AATCC, making his fund of knowledge available to many of the functioning committees.

Several changes in the Industrial Chemicals sales organization of Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, have been announced.

W M ANDERSON has been appointed manager of the New York District. He had been district manager of the Cleveland District.

J K MARSHALL has been appointed manager of the Cleveland District. He had been acting district manager of the New York District.

M W DUNCAN has been appointed district manager of the Kansas City District; T F GRADY has been transferred to the Denver Sales Office as technical representative; R E GUSTAFSON has been appointed technical representative in the Chicago District; and M H MACKAY has been transferred to the Chicago District Office as an inside salesman.

HARRY H PACT recently joined the sales staff of Quaker Chemical Products Corp, Conshohocken, Pa.

Since 1946 he has been engaged in chemical sales, first as a divisional manager for E F Drew & Co, Inc, then as technical representative for Glyco Products Co, Inc, with whom he was connected during the past five years before joining Quaker.

Mr Pact makes his headquarters in Cranston, R I, and will be engaged with the distribution of specialty chemicals to the textile, paper, and allied trades.

DONALD R GANNON has joined the sales force of Procter & Gamble's Textile Finishes Department. He will handle the sale of textile soaps, synthetic detergents and specialties to mills in North Carolina and Virginia. Before joining P&G he was employed as a quality control supervisor by the Duplan Corp, Burnside, N C. He replaces G A EMERSON, who has been transferred to the company's general office in Cincinnati.

Warwick Chemical Co, division of Sun Chemical Corp, has appointed ROBERT G PERRIELLO as Southern District sales manager. Mr Perriello, who had been serving as assistant to the general sales manager in charge of new product development and sales procedures, will direct the activities of Warwick's representatives in the South, with responsibility for the sales of Warwick's textile and industrial chemicals, as well as their Suntone printing colors. In addition he will manage Warwick's Rock Hill, S C Plant and maintain his headquarters and staff there.

JOSEPH C KING has been appointed technical director of the Southern Division of Metro-Atlantic, Inc.

Mr King, formerly research director for Fairforest Co and assistant director of research with Graniteville Co, joined Metro-Atlantic, Inc January 1, 1956.

HAROLD WALTER ELLEY, one of the country's outstanding directors of organic chemical research, and HERBERT A LUBS, a recognized authority on the science and technology of dyes and intermediates, retired from the Du Pont Company at the end of January.

Dr Elley, director of the Research Division of Du Pont's Organic Chemicals Department, joined the company in 1916.

Dr Lubs, who was editor-in-chief of the ACS Monograph on the Chemistry of Synthetic Dyes and Pigments, joined Du Pont in 1919. In 1949 he became manager of the dyes and chemical products section of the Research Division of the Organic Chemicals Dept.

The appointment of ELWOOD I CLAPP, JR, as the senior economic analyst for the Industrial Chemicals Division, American Cyanamid Company, was announced on January 25th.

Mr Clapp had been serving as assistant to the department manager, New Product Development Department, since mid-1954.

OBITUARY

MacKenzie

KENNETH MACKENZIE

KENNETH MACKENZIE, assistant manager of the Charlotte Branch, National Aniline Div, Allied Chemical & Dye Corp, died on January 23rd at Memorial Hospital, Charlotte, N C. Interment was in Sharon Memorial Park.

Mr MacKenzie, a graduate of Bradford Durfee Technical Institute, Fall River, Mass, was professor of textile chemistry and dyeing at North Carolina State College between 1922 and 1925. He joined National Aniline in 1925. He was an active member of the Piedmont Section, AATCC.

Surviving are his wife, Helen; a son, Alan K of Frederick, Md; a grandson; and a sister Mrs Clive Smith of Taunton, Mass.

F EMIL SCHULZ

F EMIL SCHULZ, 69, New England salesman for Carbic-Moss Corp, died January 30th at Quincy Hospital.

Mr Schulz, who resided in Milton, Mass, joined Carbic Color & Chemical Co, Inc March 6, 1906.

He is survived by his wife, Marguerite F, and son, Frank.

WILLIAM GRANDAGE

William Grandage, 92, died Jan 13 in University of Pennsylvania Hospital, Philadelphia, Pa. Born in Leeds, England, he came to this country at an early age and immediately went into the dyeing business, following the profession of his family for four generations before him. At the time of his death he was a retired dyer for Lenni Mills, Media, Pa.

JOHN H S SPENCER

JOHN H S SPENCER, vice president and secretary of H W Butterworth & Sons Co, Bethayres, Pa, died January 26 in Chestnut Hill Hospital after a brief illness. He was 60 years old.

Mr Spencer, a native of Philadelphia, joined the Butterworth organization in December, 1930, as manager of the foundry. He was successively treasurer, vice president in charge of production, vice president and secretary, and was a director of the company. Prior to joining Butterworth, he was with the Enterprise Manufacturing Co, Philadelphia.

Mr Spencer was a member of St Thomas Church, Whitemarsh; Philadelphia Cricket Club; the Edgemere Club in the Poconos; and the American Foundrymen's Society.

During World War I he served in the Army Medical Corps. He was brigaded with the French early in the war and later served with the U S forces.

Surviving are his widow, Alice Butterworth Spencer, a son John, Jr of Philadelphia and a daughter Mrs Henry H Reichner of Arlington, Va.

Also surviving are two brothers, Herbert S Spencer of Kew Gardens, L I and Hector A Sinzheimer of Philadelphia. There are also four grandchildren.

CHARLES THOMPSON

CHARLES THOMPSON, 55, died February 14th at 3:00 p m at his home, 904 Line Street, N E, Decatur, Ala, following a long illness.

Mr. Thompson, a native of Bern, Switzerland, had many years experience as a chemist-colorist. He was chemist-colorist in charge of New York sales division laboratory for the Burlington Mills Corp. Prior to this he was superintendent of the dyeing and boss dyer for Potomac Dyeing and Finishing Co, Hagerstown, Md, and with Columbia Piece Dyeworks, a division of Schwarzenbach and Huber, at Columbia, Pa. He was a consultant on dyeing and finishing problems for Queen City Textile Mills, at Allentown, Pa. and Narricut Fabrics Corp, Philadelphia.

Mr Thompson received a master of science degree in organic chemistry from the University of Charlottenburg in Berlin, Germany, and later, a diploma as dyer and textile engineer was conferred at the Textile Institute of Krefeld, Krefeld, Germany.

Mr Thmopson was credited with the discovery of methods for fast-color dyeing of acetate and processes for preventing destruction of chrome colors when dyed in iron machines.

He was an active member of AATCC.

He is survived by his wife, Gladys, and son, Eric, 6.

GENERAL CALENDAR

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
Gordon Research Conferences—Textiles Program, July 9-13, Colby Junior College, New London, N H.

AMERICAN SOCIETY FOR TESTING MATERIALS
Feb 27-March 2—Committee Week, Hotel Statler, Buffalo, N Y; Mar 13-16—Spring Meeting of Committee D-13 on Textiles, Warwick Hotel New York, N Y; June 17-22—59th Annual Meeting and 12th Apparatus Exhibit, Chalfonte-Haddon Hall, Atlantic City, N J; Sept 16-22—2nd Pacific Area National Meeting and Apparatus Exhibit, Hotel Statler, Los Angeles, Calif; Oct 16-19—Fall Meeting of Committee D-13 on Textiles, Warwick Hotel, New York, N Y.

ASSOCIATION OF BRITISH CHEMICAL MANUFACTURERS
Chemical Display (as part of British Industries Fair)—April 23-May 4, Olympia Hall, London, England.

DELTA KAPPA PHI FRATERNITY
32nd National Convention—April 27-28, Georgia Institute of Technology, Atlanta, Ga.

THE DRYSALTERS CLUB OF NEW ENGLAND
May 4 (Hotel Vendome, Boston, Mass); June 22 (Outing, Wachusett Country Club, West Boylston, Mass)

THE FIBER SOCIETY
Spring Meeting—May 2-3, The Clemson House, Clemson, S C; Fall Meeting—Sept 6-7, Warwick Hotel, New York, N Y.

THE INSTRUMENT SOCIETY OF AMERICA
11th Annual Instrumentation-Automation Conference and Exhibit—Sept 17-21, New York Coliseum, New York, N Y

INTER-SOCIETY COLOR COUNCIL
25th Annual Meeting, April 5-6, Statler Hotel, New York, N Y.

OPTICAL SOCIETY OF AMERICA
Session on Color, April 7, Hotel Bellevue-Stratford, Philadelphia, Pa.

PERKIN CENTENARY
May, 1956—London, England.

PERKIN CENTENNIAL
September 10-15, Waldorf-Astoria Hotel, New York, N Y.

PHI PSI FRATERNITY
Annual Meeting—April 19-21, Alabama Polytechnic Institute, Auburn, Ala.

PHILADELPHIA TEXTILE INSTITUTE
June 14 (Annual Meeting and Clambake—6 pm—College Campus, Germantown, Pa); June 15 (Outing—Manufacturers Golf & Country Club, Oreland, Pa); June 16 (Commencement—College Campus—11 am).

THE QUARTERMASTER ASSOCIATION
Annual Convention—Oct 27-28, Conrad Hiltos Hotel, Chicago, Ill.

QUEBEC SECTION, CANADIAN ASSOCIATION OF TEXTILE COLORISTS AND CHEMISTS
Mar 17 (McGill Univ, Montreal, Que); Apr 20-21 (Annual Meeting, Sheraton Mt Royal Hotel, Montreal); June 16 (Annual golf tournament).

SOUTHERN TEXTILE EXPOSITION
19th Exposition, Oct 1-5, Textile Hall, Greenville, S C.

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
Mar 13, Apr 12 (Palm Terrace Suite, Hotel Roosevelt, New York, N Y); May 16-18 (Outing—Skytop, Pennsylvania); June 12, Sept 11, Oct 9, Nov 7 (Palm Terrace Suite, Hotel Roosevelt, New York, N Y)

TEXTILE RESEARCH INSTITUTE
1956 Annual Meeting—March 22-23 Hotel Commodore, New York, N Y.

TEXTILE TECHNICAL FEDERATION OF CANADA
5th Bi-annual Textile Seminar—June 5-7, Queen's Univ, Kingston, Ont.

ABSTRACTS

Wool and Silk Dyeing (Gloria)

Schmatzler, K H, *Dyestuffs* 41, 71-4, December, 1955.

Not too many years ago wool and silk fabrics of many varieties and of an extremely wide range of construction were frequently used for dress wear. Today, woolens containing silk specks frequently show up, especially in the lower-priced materials where reworked wools are used, and very often the silk cannot be removed by carbonizing. As the silk specks show up quite noticeably and cause many headaches to the dyer, this paper is intended as a guide in covering the silk so that it beco...es inconspicuous.

Success in covering the silk so that it blends with the wool is based on having the silk on the heavy and dull side wherever possible, so that the sheen will not be obvious. Selection of suitable dyes is the key to the dyeing, and their properties must be noted carefully. Solid shades are dyed on wool/silk fabrics with either acid milling dyes having good affinity for silk, or direct dyes that are specially suited. Frequently a combination of both acid and direct dyes is used. As a rule, the direct dyes cover the silk better than the acid dyes.

Silk is best dyed below the boil (150-160°F); on the other hand, the wool dyes best at or near the boil, but boiling over a long period of time deprives the silk or part of the dye which is subsequently absorbed by the wool. Consequently, in order to dye silk and wool the same depth, or preferably the silk heavier, prolonged boiling must be avoided.

Some dyers have to resort to a silk-covering operation in a fresh bath (speck-dyeing) with dyes having good affinity for silk and very little for wool at low temperatures (80°F).

The author has found that the use of common salt (20-30%) rather than Glauber's salt, and even the addition of 3-5% Epsom salt gives the best results. In his opinion, Glauber's salt used in place of common salt dyes the silk much weaker.

A list of suitable acid milling and direct dyes for this purpose is provided. —WHC.

Weather Resistance Improved by Acetylating Vat-dyed Cotton

Berard, W N, Gremillion, S G and Goldthwait, C F, *Textile Inds* 119, 120-1, December, 1955.

A new procedure being developed at the Southern Regional Research Laboratory is said to make suitably treated cotton last two to three times its usual life on exposure to weather.

The susceptibility of cotton to microbiological and photochemical changes is generally recognized. Resistance to this degradation can be obtained by acetylating the cotton, but if the fabric so treated is subsequently dyed with vat colors, saponification of the cellulose acetate takes place.

The authors recommend that the fabric be first vat-dyed by the usual process, with selected dyes fast to light, and then acetylated to about 18 percent acetyl content by standard procedures.

Fabric so treated, after exposure to weather for six months, still retained approximately 90 percent of its tensile strength; untreated fabric, by comparison, retained only about 50 percent.—WHC.

Roller Printing Spun Rayons

Anon (Technicus), *Modern Textiles* 36, #11, 46, 94; #12, 49, 86 (1955).

In the printing of spun rayons, much will depend on good preparation of the fabrics, so that they are free from starchy sizes; that they are absorbent, and fully relaxed. Another important factor is the proper engraving of the copper rolls.

Spun rayon has a disadvantage in that the fibers swell under the influence of aqueous media. This swelling action increases the difficulty of penetration of the dye into the fiber. The author recommends fairly thin print pastes, or pastes with large amounts of thickeners with low solids content (eg, gum tragacanth). However, thickeners alone, he says, will not solve all the problems, which have to be approached from another angle, namely, the engraving of the rolls.

The author gives much information on the engraving technique, and cites several examples of faulty printing that was corrected by a change in the depth of the lines. To prevent soiling of the light colors by the darker ones he recommends chromium-plating the rolls.

He also discusses the problems involved in drying the prints, particularly when deeply engraved rolls are used. Drying cans of large diameter are recommended, so that the print will dry as much as possible on the first can and will not mark off on the second one. He suggests the use of a gum roll, when necessary, to remove surplus color. Several advantages of the gum roll are described, but prints that have been crushed with excessive pressure on the roll are said to appear bare and ill-furnished.

The author also offers suggestions for overcoming various other engraving troubles.—WHC.

Decomposition of Formosul Effect of Variables in the Printing of Vat Colors

Liquorice, W F, *Dyer* 114, 827-8, November 25, 1955.

The printing behavior of a vat dye is determined by three fundamental properties of the dye itself:

1) Leuco potential
2) Rate of reduction
3) Rate of diffusion.

The first two concern reduction of the dye, and it is therefore important that the properties of the reducing agent, in this case Formosul (sodium sulfoxylate formaldehyde), should be understood.

The present investigation was undertaken to determine the effect on Formosul of the more important variables in the printing of vat colors. These were separated as follows:

1) Effect of the cloth
2) The constituents of the print paste
3) Effects produced between printing and steaming
4) Effects during steaming.

For the estimation of Formosul, portions of the print were extracted with water and the extract titrated with iodine. The results obtained by the author are summarized as follows:

Cotton and rayon fabrics had no effect when thoroughly scoured and bleached. The natural coloring matter in linen, however, had a marked catalytic effect.

Certain dyes increased the rate of decomposition of Formosul more than others, those readily reduced having the greatest effect.

Catalysts known to increase the reducing power of the system (eg, anthraquinone or iron salts) had a marked effect on the loss of Formosul.

Thickeners of low total solids (eg, starch-trag) caused more loss than those of high solids (eg, British gum).

Exposure to air between printing and steaming can give rise to considerable loss of Formosul, depending on atmospheric conditions, the most important of which is humidity. Providing the prints remain dry, the rate of decomposition is not serious.

Formosul is also affected by elevated drying temperatures such as are obtained on high-pressure drying cans.

The rate of decomposition in the ager is surprisingly high. The author warns that if Formosul of too low concentration is used, it may lose its strength before the dye is reduced.—WHC.

• PATENT DIGEST •

PAUL WENGRAF

FOR the convenience of readers of "Patent Digest", there appears below a number of German patents, which have been listed in *Deutsches Patentblatt.* Space limitations prohibit our reviewing them, but the complete original specifications may be obtained from the Sales Department, Deutsches Patentamt, Gitschiner Str 97-103, Berlin SW 61, Germany. Translated abstracts may be obtained for a nominal fee from Dr Paul Wengraf, 88-36 Elmhurst Ave, Elmhurst 73, N Y.

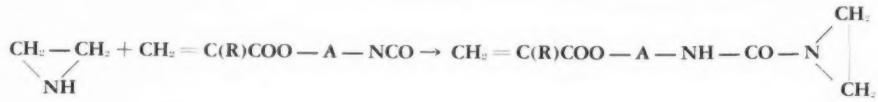
German Pat No.	*Date*	*Assignee and Title*
924,511	1/27/55	Ciba AG, "Improving the fastness properties of dyeings or prints containing water-soluble dyes"—cl 8 m, 1/01
924,564	1/27/55	Farbwerke Hoechst, "Finish for improving textiles of cellulose or cellulose hydrate"—cl 8 k, 1/20
924,627	2/3/55	Farbenfabriken Bayer, "Softening agent for cellulose and regenerated cellulose"—cl 8 k, 1/08
924,745	2/3/55	Ciba AG, "Printing and dyeing superpolyamide fibers"—cl 8 m, 1/01
924,861	2/10/55	Phrix Werke Akt Ges, "Improving crease resistance of fibers and fabrics"—cl 8 k, 1/20
925,042	2/10/55	Bad Anilin- & Sodafabrik, "Improved resistance to gas fading of cellulosic esters and ethers"—cl 8 m, 1/05
925,043	2/10/55	Am Cyanamid, "Dyeing with vat dyes at elevated temperatures"—cl 8 m, 3/01
925,044	2/10/55	Farbwerke Hoechst, "Printing water-insoluble monoazodyes on fibers of cellulose acetate or polyamides"—cl 8 n, 1/03
925,164	2/17/55	Bobingen Aft Ges f Textilfasern, "Process of treating fibers and fabrics containing warps of synthetic linear amido superpolymers"—cl 8 k, 1/30
925,225	2/17/55	Dow Corning Corp, "Impregnating agent and process for finishing, particularly for hydrophobing textiles"—cl 8 k, 3
925,226	2/17/55	Weissenberg, "Process of hydrophobing organic fibrous materials, especially textiles"—cl 8 k, 3
925,886	3/3/55	Groehn, "Impregnating agent for 'Persenning' (tarpaulin) cloth"—cl 8 k, 3
926,243	3/17/55	Farbwerke Bayer, "Process of printing ice colors on textiles"—cl 8 n, 1/03
926,602	3/24/55	Boehme Fettchemie GmbH, "Fulling animal fibers"—cl 8 k, 5
926,725	3/24/55	Farbenfabr Bayer, "Emulsions of hydrocarbons in water"—cl 8 n, 2
926,841	3/31/55	Pierer, "Process comprising wet treatments of textiles"—cl 8 k, 1/40
927,871	4/21/55	Chem Fabrik Pferee GmbH, "Finishing, particularly creaseproofing textiles"—cl 8 k, 1/20
927,807	4/21/55	Ciba AG, "Treatment of wool with aqueous solutions containing available chlorine"—cl 8 k, 1/25
927,872	4/21/55	Pierer, "Mercerizing Process"—cl 8 k, 2
927,808	4/21/55	Bad Anilin- & Sodafabrik, "Process of producing phthalocyanine dyes on textiles (printing)—cl 8 n, 1/01
928,043	4/28/55	Phrixwerke, "Improving crease resistance of fibers and fabrics"—cl 8 k, 1/20
928,165	4/28/55	Pierer, "Dyeing half-wool"—cl 8 m, 2/01
928,166	4/28/55	Farbenfabriken Bayer, "Producing water-insoluble azodyes on fibrous materials"—cl 8 n, 1/03
928,343	5/5/55	Farbenfabriken Bayer, "Gydrophobing fibrous material"—cl 8 k, 3
928,402	5/5/55	Bad Anilin- & Sodafabrik, "Improving the resistance of dyed cellulose esters and ethers to gas fading"—cl 8 m, 1/05
928,708	5/12/55	A Monforts, "Process and apparatus for finishing fabrics by passing them through baths containing heat-hardenable or polymerizable ingredients"—cl 8 k, 1/20
928,826	5/18/55	Bad Anilin- & Sodafabrik, "Process of dyeing structures of vinyl polymers"—cl 8 m, 1/01
929,845	6/8/55	Em Mende, "Ager for fixing dyeings or prints in fabrics"—cl 8 c, 11/03
929,962	6/8/55	Bad Anilin- & Sodafabrik, "Producing fast dyeings on threads, fabrics etc of cellulose esters or ethers"—cl 8 m, 1/05
929,963	6/8/55	H Rath, "Improving fastness properties of prints or dyeings obtained with sulfur dyes"—cl 8 m, 8/01
930,025	6/8/55	Farbenfabr Bayer, "Fiber printing process"—cl 8 n, 1/01
929,791	6/8/55	Nat Lead-Hauser, "Production of gel-forming organophilic clay"—cl 12 s
930,628	6/23/55	Farbwerke Hoechst, "Process of producing full-shrunk polyamide-fibers"—cl 8 k, 1/40
930,629	6/23/55	Chemstrand Corp, "Dyeing polyacrylonitrile structures with acid dyestuffs"—cl 8 m, 1/01
930,630	6/23/55	W Meitner, "Multicolor printing on textiles or other fabrics and apparatus therefor"—cl 8 n, 1/01
930,924	6/30/55	Chem Fabr Pfersee, "Durable finish, especially creaseproofing treatment for textiles"—cl 8 k, 1/20
931,887	7/21/55	Dehydag-Schirm, "Process of hydrophobing textiles, paper, foils, leather, etc"—cl 8 k, 3
932,243	8/4/55	Chem Fabr Stockhausen-München, "Durable fixation of pigments on regenerated cellulose"—cl 8 k, 1/15
933,143	8/25/55	Ciba A G, "Process of improving fastness properties of dyeings and prints and composition used in this process"—cl 8 m, 7
933,622	9/1/55	Bad Anilin- & Sodafabr, "Process of dyeing textiles containing polyamide- or polyurethane fibers"—cl 8 m, 1/01
935,665	10/27/55	Schaeffer & Co (Haut Rhin France), "Process of fixing various dyestuffs on textile fabrics in continuous procedure"—cl 8 c, 1
935,545	10/27/55	Bad Anilin- & Sodafabr, "Production of ethylene imine derivatives"—cl 12 p, 5
936,028	11/3/55	Bad Anilin- & Sodafabrik, "Finishing of dyed fabrics made from mixtures of cellulose acetate and cellulosic fibers"—cl 8 k, 1/20
936,030	11/3/55	Farbwerke Hoechst, "Dyeing with metal complex dyes"—cl 8 m, 7
935,964	11/3/55	Farbwerke Hoechst, "Dyeing mixed fabrics containing cellulose-acetate and linear polyamide- or polyurethane fibers"—cl 8 m, 12
936,086	11/10/55	Durand & Huguenin, "Delustering effects, stable to soaping on textiles, particularly rayon"—cl 8 k, 1/15
936,325	11/10/55	Bad Anilin- & Sodafabrik, "Finishing fabrics consisting of cellulose hydrate"—cl 8 k, 1/20
936,326	11/10/55	Tootal Broadhurst Lee Co, "Reducing felting of wool or other animal fibers"—cl 8 k, 1/25
936,087	11/10/55	Cilander A G, "Textile Finishing Process"—cl 8 k, 2
936,327	11/10/55	Higgins - Read, "Protection of textiles against microbial attack"—cl 12 q, 14/04
936,263	11/10/55	Sandoz A G, "Dyeing polyacrylic fibers and dyestuff solutions used therefor"—cl 8 m, 1/01
936,328	11/10/55	Farbenfabr Bayer, "Process of finishing textiles"—cl 8 n, 1/01
936,503	11/17/55	Bad Anilin- & Sodafabrik, "Dyeing polyvinyl fibers"—cl 8 m, 1/01
936,866	11/24/55	Alfred Esch, "Starching product to be used in laundries"—cl 8 k, 1/08

SHRINKPROOFING WOOL ———Ethylene-ureidoesters of Acrylic or Methacrylic Acids A,2,04

USPat 2,686,772 (Rohm & Haas——Bortnick)

Shrinkproofing of wool with solutions obtained by emulsion polymerization of vinyl- or acrylic-acid compounds has been suggested in the past. Reference may be made, for instance, to American Cyanamid's USPat 2,565,259 [cm *Am Dyestuff Reptr 41,* 10 (1952), noting also references cited in this connection].

According to the present patent, valuable polymerizates to be used for the same purpose can be prepared by reacting *ethylene imine with an isocyanato ester of acrylic acid.* The reaction takes the form:



wherein "R" is H or methyl and "A" one of the following groups:

These compounds can be copolymerized further with substances that are capable of producing copolymers, for instance, acrylic esters, dialkylacrylamides, divinylbenzene, and generally with compounds containing a vinylidene group . . . $CH_2C<$.

According to the examples, the aforementioned substance constitute the major part of the polymer preparations. For example, one such mixture contained 95% ethyl hexyl acrylate, the remaining 5% being N-N-ethylene-ureido ethyl methacrylate:

This mixture was added to an aqueous solution of a dispersing agent of the Igepal type (alkylphenols plus ethylene oxide); suspension was polymerized at low temperature. The emulsion so obtained was padded on a woolen fabric. After being heated to 240°F or more the treated fabrics reportedly shrank less than 5% after 300 minutes laundering, while the nontreated specimens shrank almost 50% under equal conditions.

Ethyl hexyl acrylate is said to leave the hand of the finished fabric quite unchanged in contrast to lower acrylates (ethyl or butyl), which are said to produce a slight harshening effect.

No references are cited by the Patent Office.

GLAZING OR EMBOSSING COTTON FABRICS, Impregnated with Xanthates, Aftertreated with Formaldehyde G,4

USPat 2,689,194 (Sayles Finishing Plants——Russell, Allen——Sept 14, 1954)

A permanent finish and especially a durable calendering effect (in embossing, glazing, bettling, etc, operations) generally has been obtained by applying resins of the urea-, thiourea, or melamine-formaldehyde types. These nitrogen-containing finishes are known to be chlorine retentive and to cause yellowing.

The purpose of the current invention is to avoid chlorine-retaining finishes in general, using instead reaction products of cellulose with formaldehyde to produce durable effects. It has been observed that impregnation with viscose (cellulose xanthate), regenerated thereafter with dilute acids, gives good results by forming fresh cellulose layers on the fabrics. Subsequently the fabric is washed and subjected *while still in the moist state* to mechanical treatment. The calendering effect is made durable by a formaldehyde aftertreatment. A curing catalyst, such as ammonium thiocyanate, an acid or an acid salt, has to be added.

It could be assumed that the freshly regenerated cellulose deposited on the fiber in the first and second steps might more easily help form the formaldehyde condensate than would the nonregenerated cellulose of the fabric. One of the examples (#3), however, calls for a formaldehyde treatment and curing of the viscose-treated fabric *before regenerating* the xanthate; logically, the reaction occurs immediately with xanthate.

Example: A bleached cotton fabric was impregnated in a xanthate solution containing 3% of cellulose, sodium hydroxide and, as a softener, an alkaline dispersion of a substituted fatty amide. It was then squeezed to a pickup of 50%, run into a bath of 10% sulfuric acid, rinsed well, and partly dried (moisture content 15%), after which it was passed through a frictioning calender at 400°F. Thereafter the calendered fabric was padded in a 5% of formaldehyde solution containing 3% of ammonium thiocyanate, tentered and cured. A wash-resistant, glossy finish, with a pleasant hand resulted.

Among the references cited by the Patent Office:

USPat 1,036,282 (Lilienfeld/1912): treating textile fabrics in general with viscose solutions and regenerating the cellulose on the fiber substrate.

USPat 2,119,150 (Bradford Dyeing Assoc/1938): treating acid-pretreated cellulose fabrics with formaldehyde and embossing to obtain durable effects.

USPat 2,314,277 (Rohm & Haas/1943): obtaining glazed fabrics with a finish containing cellulose ethers or cellulose esters combined with quaternary ammonium compounds.

USPat 2,504,857 (Bancroft & Sons/1950): creaseproofing of cotton fabrics with mixtures of methylated and nonmethylated methylolmelamines [cf *Am Dyestuff Reptr 39,* 524 (1950)].

USPat 2,104,748 (Sayles Finishing/1938): producing sheer, crisp cellulosic fabrics by first impregnating with a viscose solution, then with dilute sulfuric acid to regenerate the cellulose, and finally mercerizing.

USPat 2,411,818 (Heberlein Pat Corp/1946): making textiles shrink-resistant by means of an acid-formaldehyde treatment combined with colloidal finishing substances, such as starch, carob meal, gums, gelatine, etc [cf *Am Dyestuff Reptr 36,* 248 (1947)].

DISCHARGES IN EMULSION PRINTING———Silicofluorides for Curing Thermosetting Resins D2,02

USPat 2,689,162 (Interchemical Corp——Lee, Siepert——Sept 14, 1954)

Pigment-printing emulsions of the water-in-oil type, as well as those of the oil-in-water type, are being used in application-printing techniques in considerable and ever-increasing amounts. Discharge prints based on pigment-emulsion formulas have been described in the past (USPat 2,267,620, see references below) wherein the discharging agent had been emulsified in the internal (aqueous) phase, while the dyestuff pigment was homogenized with the external (lacquer) phase.

The current specification states that several disadvantages have been observed in applying this discharging method, eg, lower color value, poor adhesion of the

formed resin to the fibers, and loss of discharge power of cuts on aging. Most of these difficulties can be avoided by adding metal silicofluorides to the aqueous phase containing the reducing (discharging) agents, but not all silicofluorides have been found to give the effect desired. For instance, ammonium silicofluoride is not operable in this method, but the cadmium, mercury, magnesium, and, preferably, zinc silicofluorides were found to be appropriate. The use of the latter salt is advocated especially because it is water soluble up to 30% and is readily available. It acts as an efficient *accelerator* for the thermosetting resins that are applied in the lacquer phase. However, one of the three examples cited calls instead for the use of magnesium silicofluoride in the printing emulsion and in the clear (cut).

The printing pastes of the water-in-oil type, after being cut, should contain 0.5-10% of the binder resin composition (up to 5% of the thermosetting resin body), 5-30% discharging agent, and 0.25-5% silicofluoride; the total aqueous phase amounting to 40-80% of the paste. In one example, the lacquer phase is comprised of 15% of the pigment (TiO_2), 7.5% of oil-modified glyceryl phthalate, and 2.5% of solvent-soluble urea-formaldehyde resin (Beetle 227-8) dissolved in 33.5% of xylene and 1.5% of butanol. The aqueous phase to be homogenized with the lacquer phase consists of 35% of zinc sulfoxylate solution (20%) and 5% zinc silicofluoride solution (30%). A pure white discharge is obtained by printing an azodyed fabric upon aging. Colored discharges (phthalocyanine) can be obtained in an analogous way.

References cited by the Patent Office:

USPat 2,555,277 (Am Cyanamid/1951): shrinkproofing wool with an aqueous solution of alkylated methylolmelamine containing diammonium phosphate plus sodium silicofluoride as curing accelerator. [Cf also the same Company's USPat 2,620,322 (1952), *Am Dyestuff Reptr 42,* 739 (1953)].

USPat 2,413,624 (Am Cyanamid/1946): ammonium salts of complex fluorine containing inorganic acids, particularly ammonium silicofluoride or ammonium borofluoride, are used as curing catalysts for urea-formaldehyde condensates.

USPat 2,361,277 (Ciba/1941) describes a pigment printing paste that employs a solvent (xylene) as a thickener. In it a casein-borax-urea (or melamine, etc) solution has been emulsified, followed by an addition of formaldehyde, the casein content being limited to 12%.

USPat 2,267,620 (Interchem Corp/1941) describes a textile printing discharge paste in the form of an emulsion, the outer phase containing an organic solution of film-forming substance (eg, ethylcellulose in a volatile solvent), while the inner phase is formed by an aqueous solution of a discharging agent.

CREASE-RESISTANT, NON-YELLOWING FINISH——Specific Ratio of Two Resin Components G,2,04

USPat 2,690,404 (Dan River Mills——Spangler, Wayland Jr——Sept 28, 1954)

The specification states that crease-resistant finishes based on alkylated polymethylolmelamines (eg, Resloom HP or M-75 Special) or on dimethyl-ethylene urea (Zeset S or Rhonite R-1) have the tendency to retain chlorine, consequently to yellow, or (as in the case of Zeset) to impair the tensile strength of the material.

It has been observed unexpectedly that a compound containing *both of these components* at a ratio of 2¼ mols of dimethylolethylene urea to one mol of alkylated polymethylolmelamine will produce a wrinkle-resistant finish without causing the aforementioned disadvantages, provided the curing step is carried out under conditions which allow all the resin present to be fixed on the fabric. Raised temperature, lengthened curing time, increased amounts of acidic catalysts, and lowered alkali content are factors which contribute to a "hard cure." Proper balance of these factors is required. Catalyst AC (approximately a 35% solution of 2-methyl-2-amino propanol hydrochloride) is mentioned as an efficient catalyst.

Example: A stable solution of a resin containing 270 p Resloom M-75 Special (0.88 mols) and 584 p Zeset S (2 mols) was obtained by stirring the highly concentrated solutions of the two components with hydrochloric acid at 30°C, then adjusting with caustic to pH 10. A solution containing 7% of this product and 1% of Catalyst AC was used for padding bleached, mercerized and soured cloth. The fabric showed high wrinkle resistance and no chlorine retention.

Among the references cited by the Patent Office:

USPat 2,504,857 (Bancroft & Sons/1950): creaseproofing of cotton by a treatment with methylated and nonmethylated mixtures of melamines [cf *Am Dyestuff Reptr 39,* 524 (1950)].

USPat 2,582,961 (Am Cyanamid/1952): flame-resistant finishes comprising mixtures of heat-curable methylolmelamines, methylol ureas, etc; also alkylated derivatives thereof with methylol cyanamide and an oxygen-containing acid of phosphorus.

USPat 2,622,995 (Bancroft & Sons/1952): impregnating a fabric with acid-curable aldehyde resin compositions, drying under moderate conditions (pH not below 6), embossing and curing. (Apparently one of the "Everglaze" patents) [cf *Am Dyestuff Reptr 42,* 848 (1953)].

Spezialisierung

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